

FIG. 1

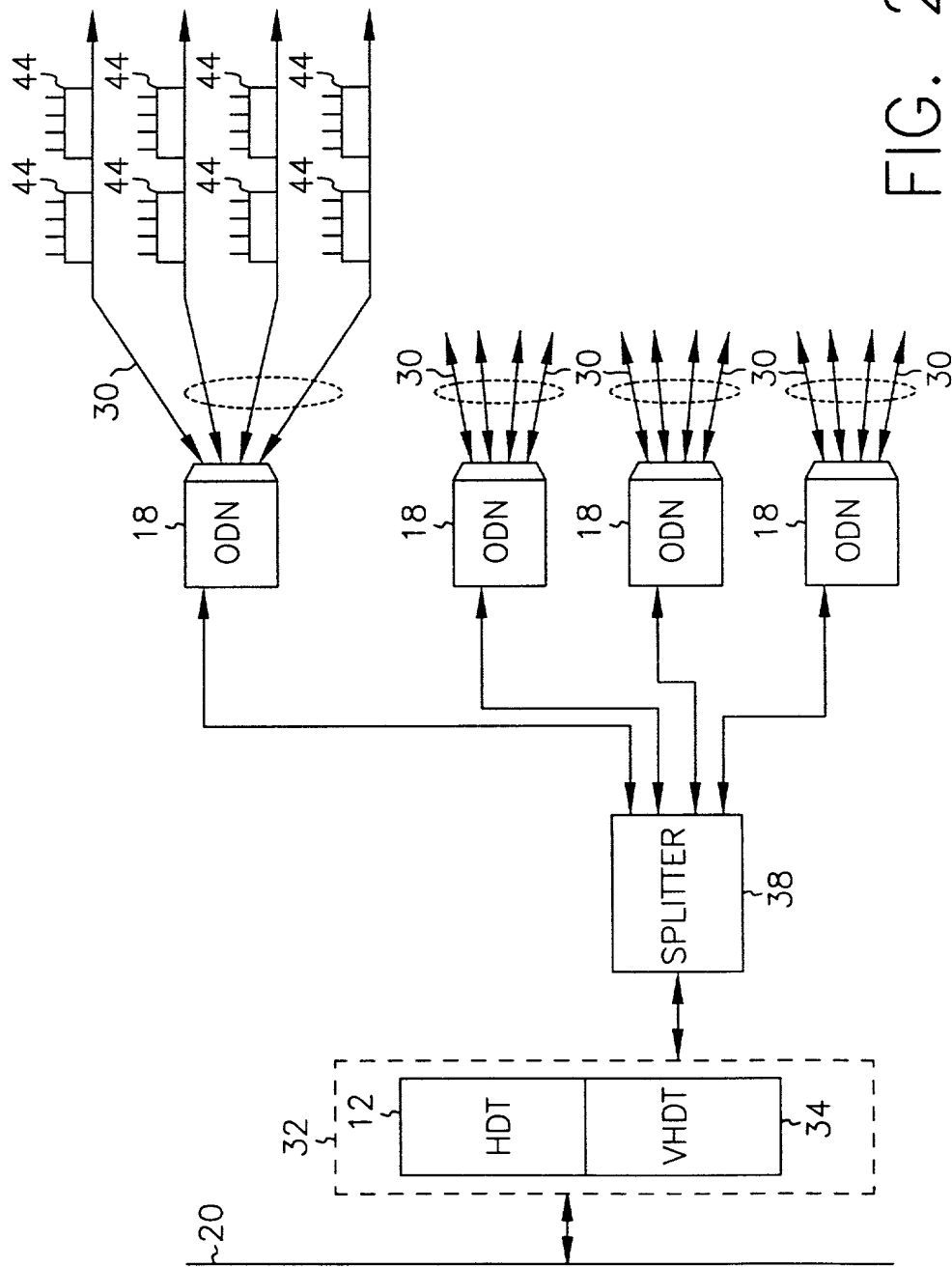


FIG. 2

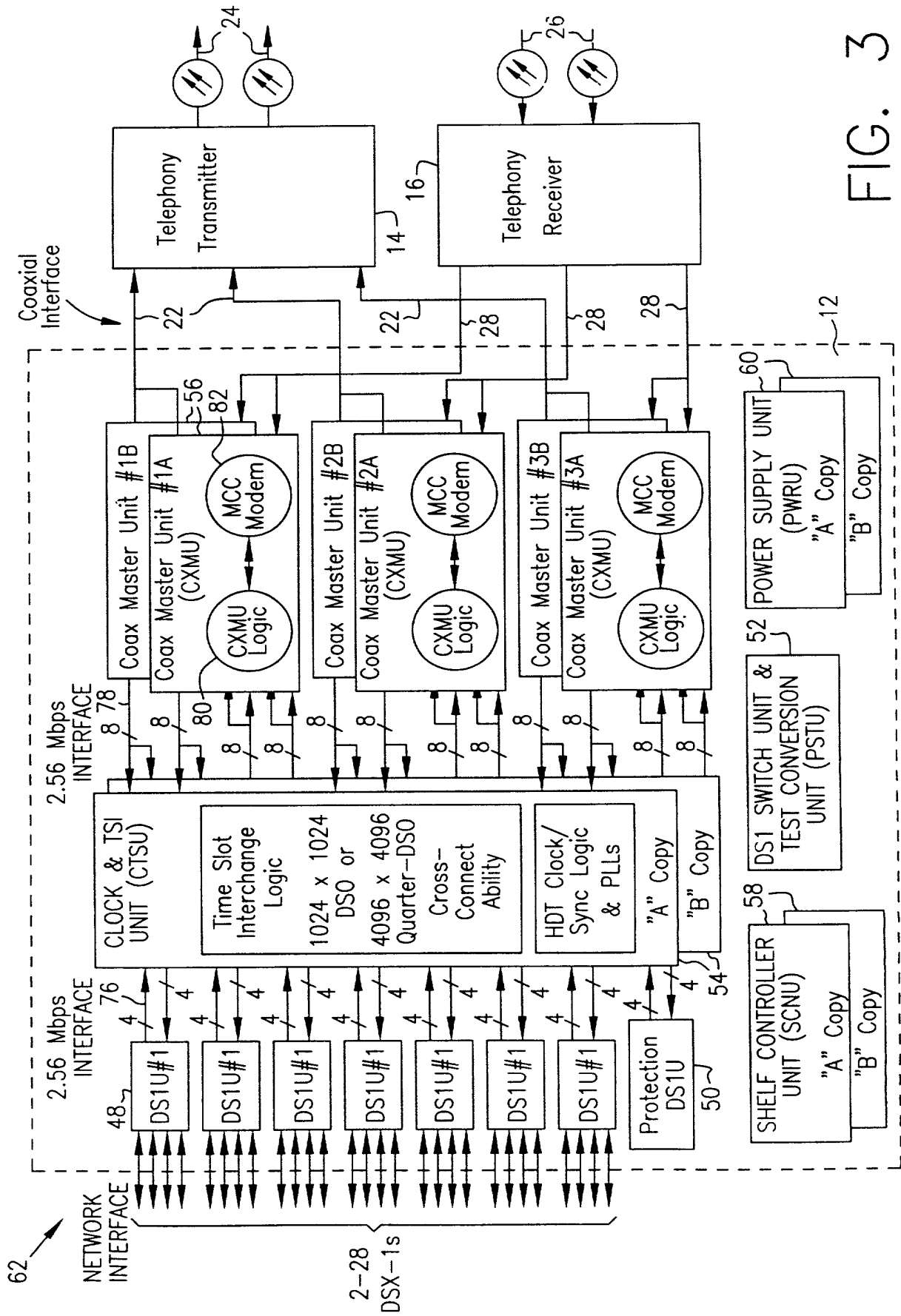


FIG. 3

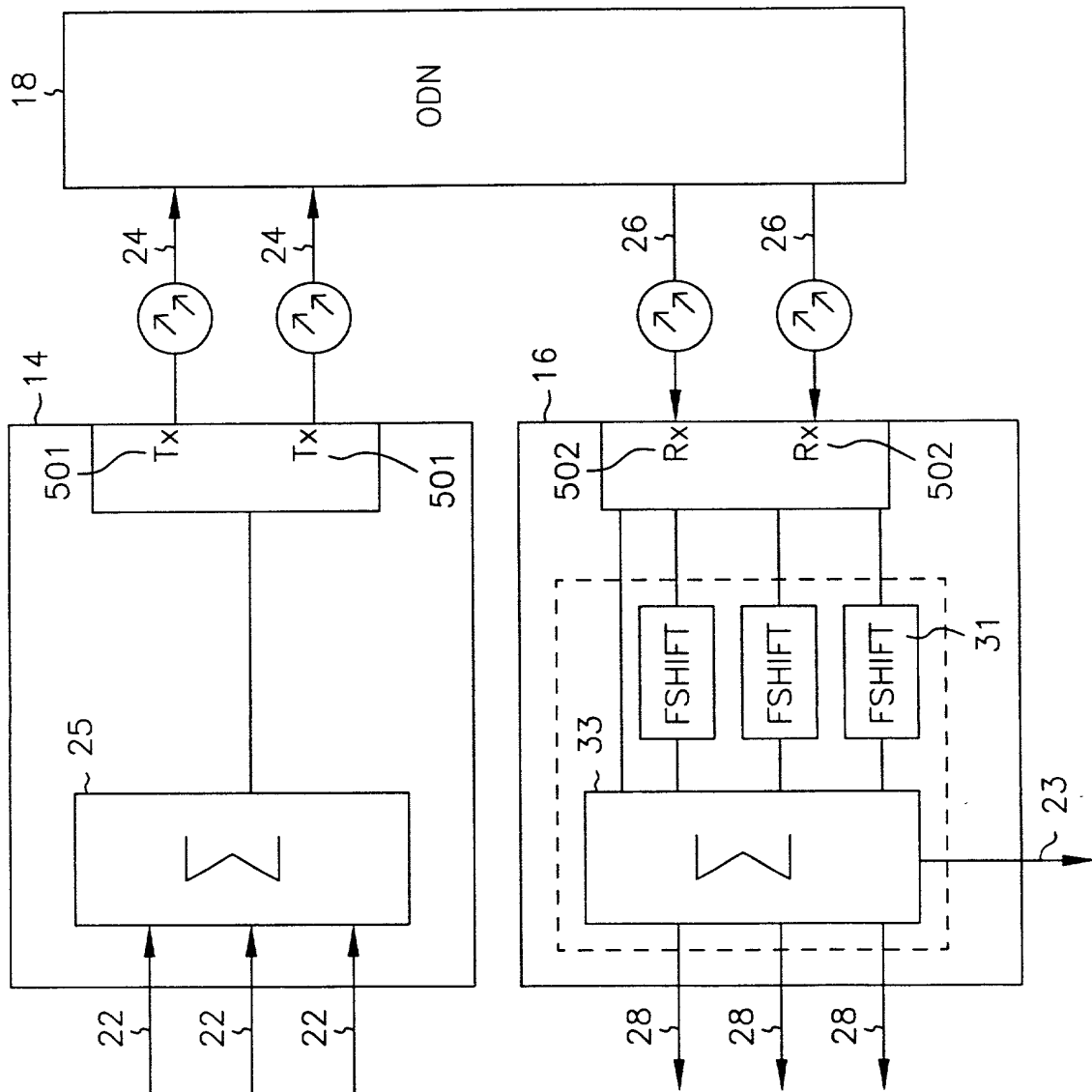


FIG. 4

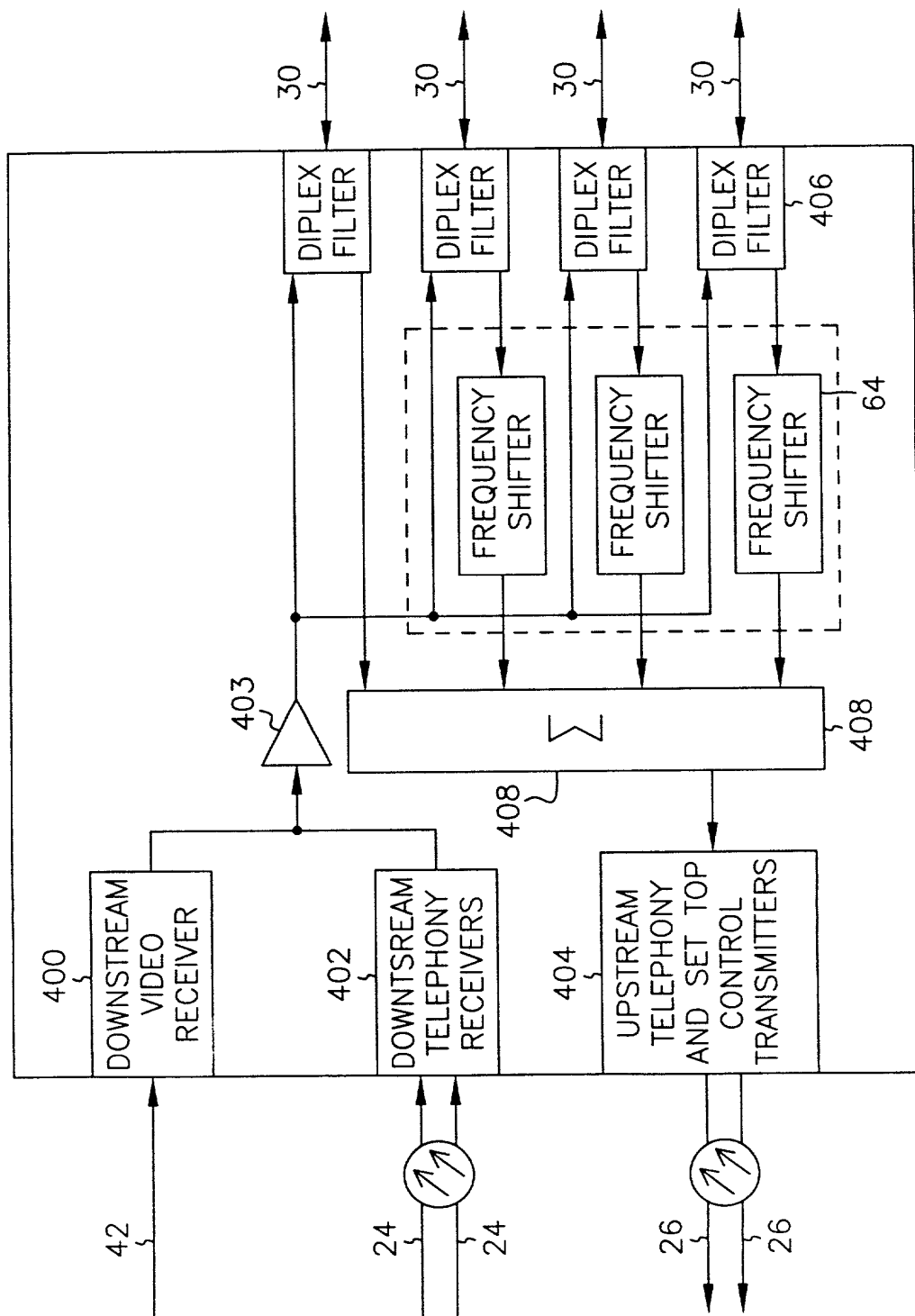
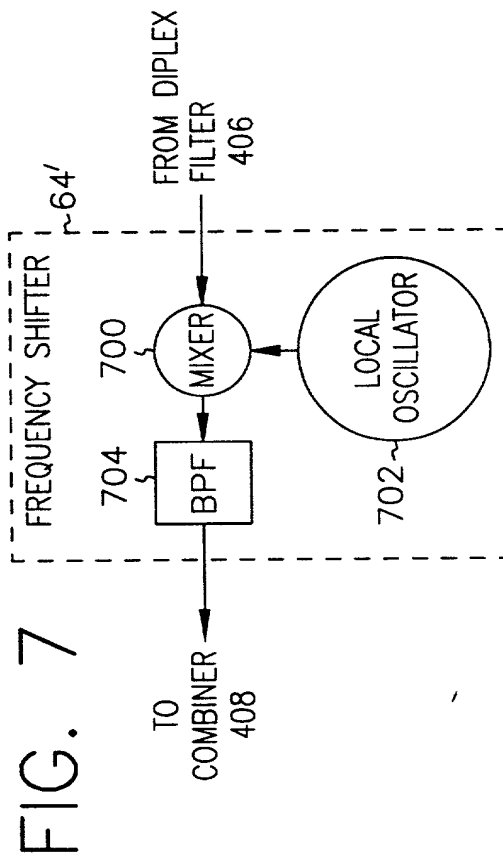
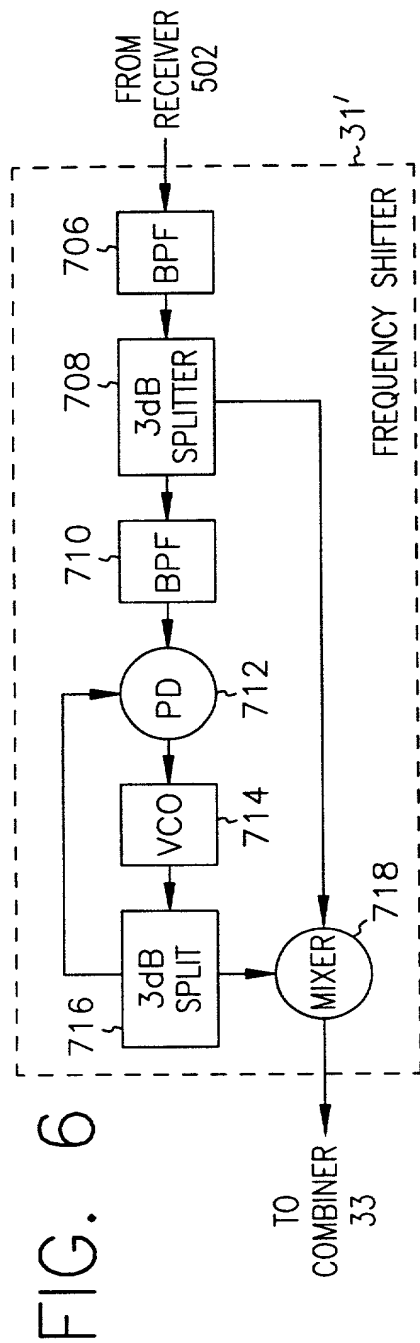


FIG. 5



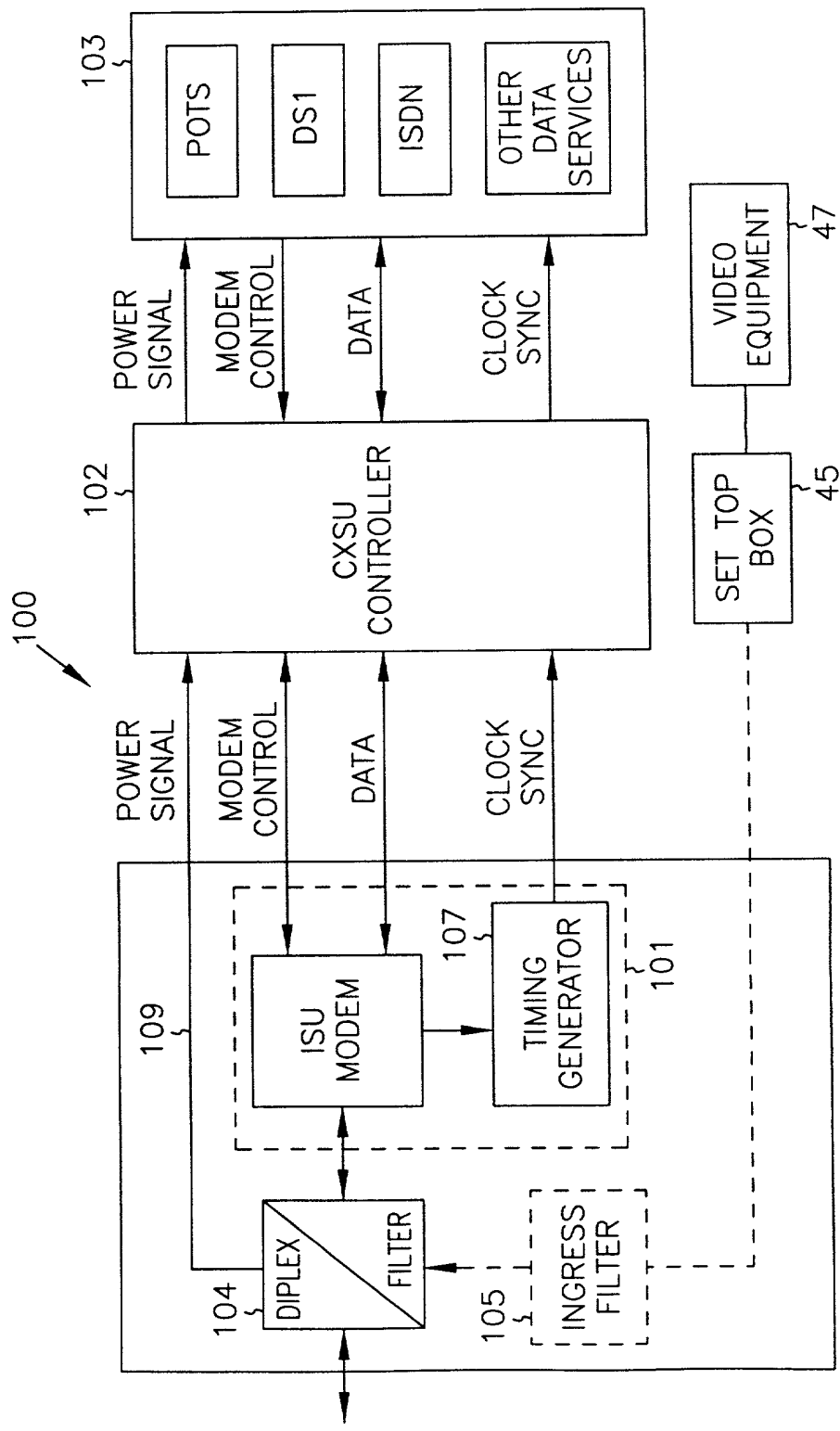


FIG. 8

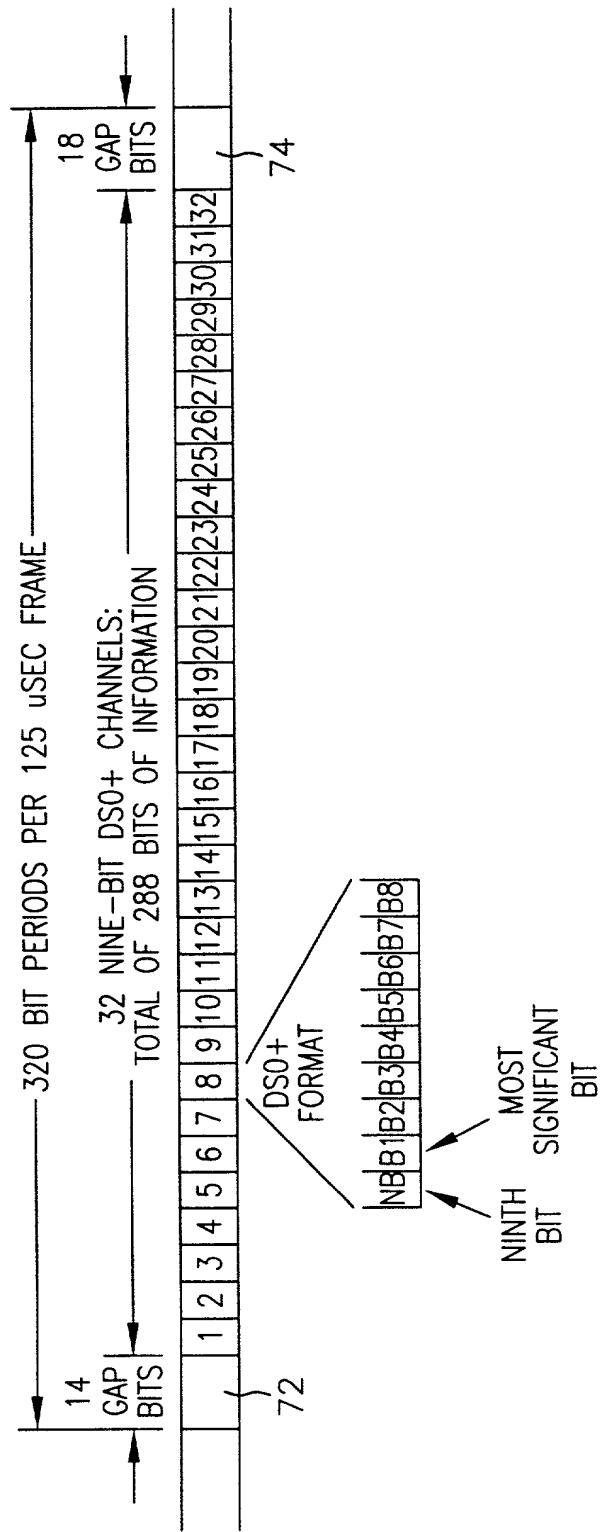


FIG. 9

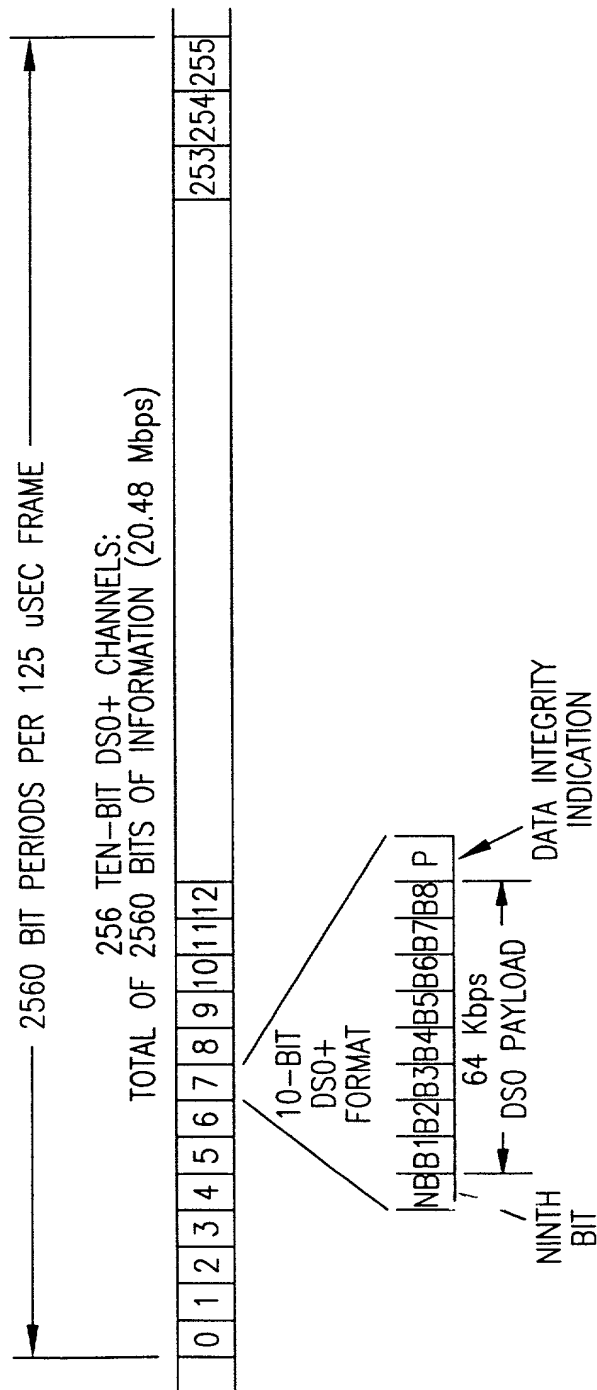


FIG. 10

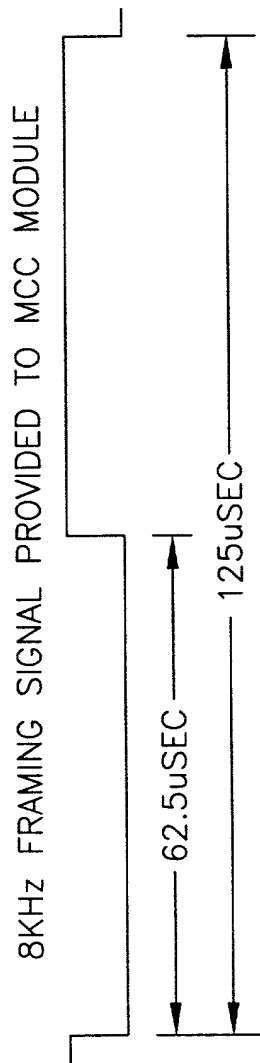


FIG. 11

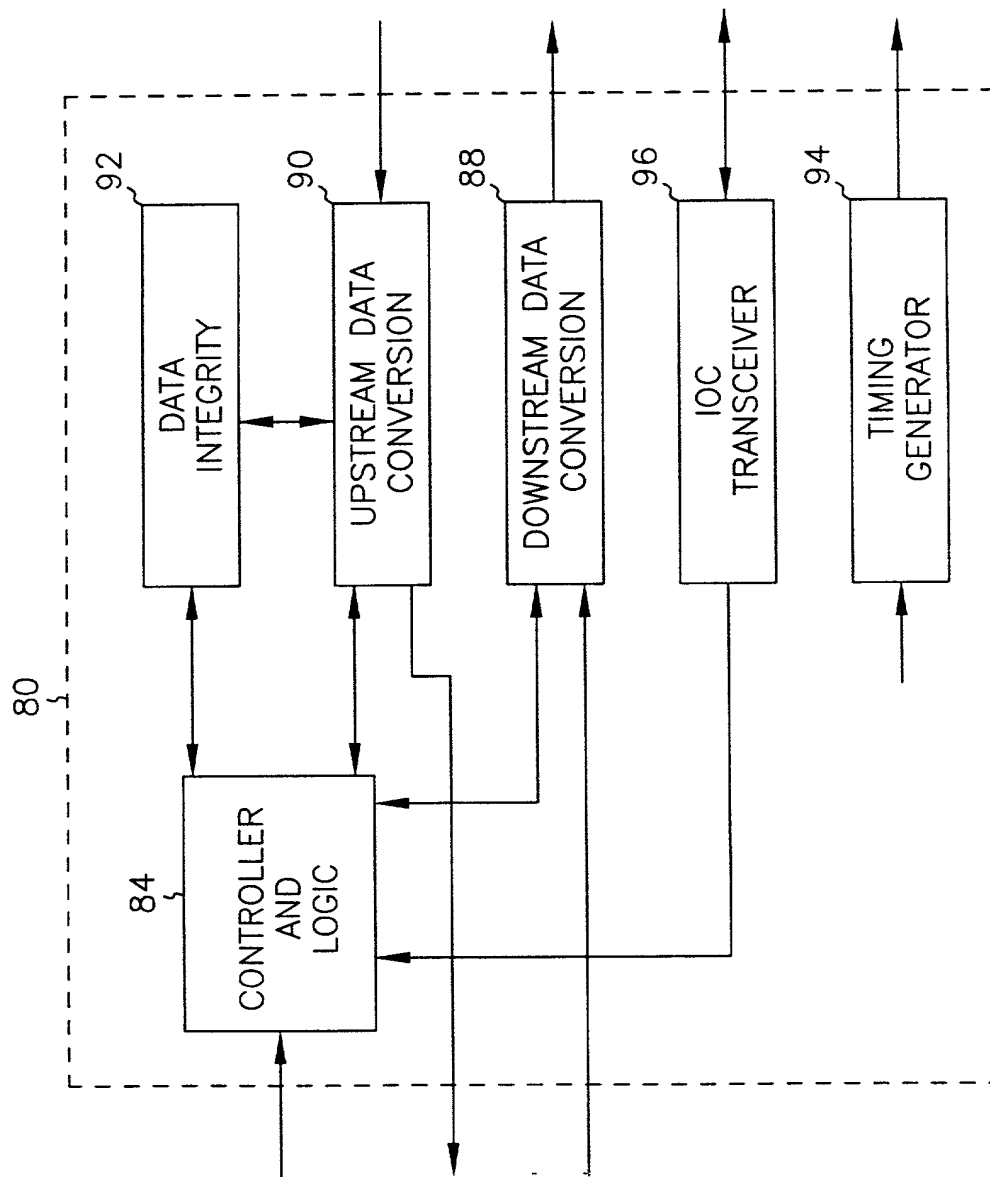


FIG. 12

FIG. 14

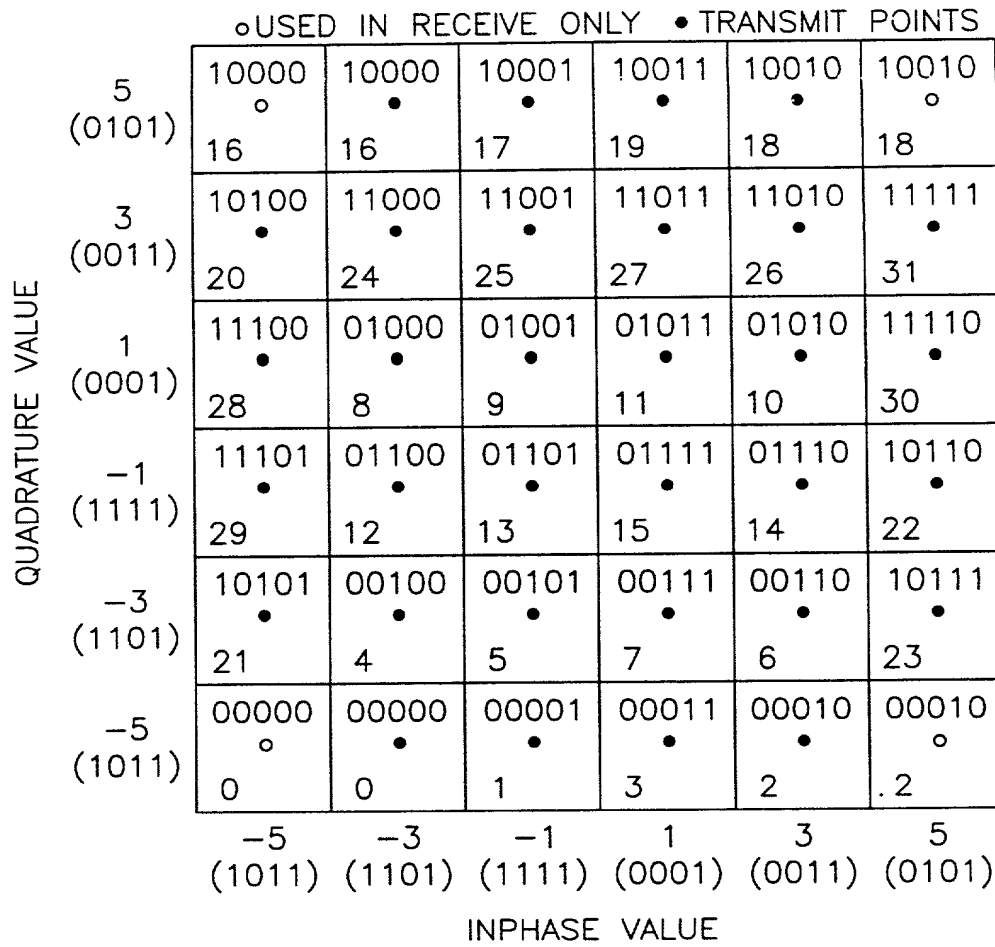


FIG. 14

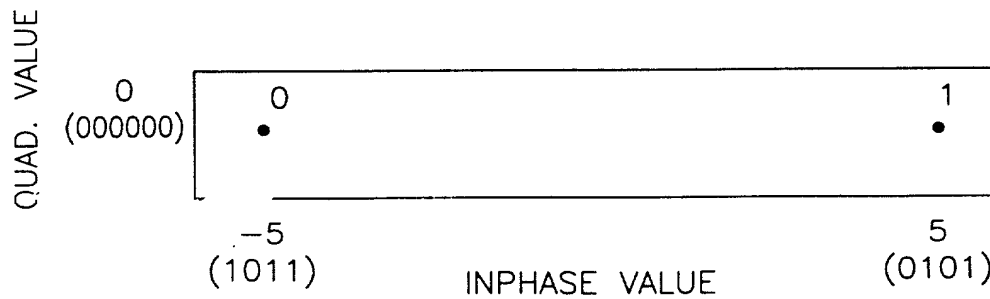


FIG. 15

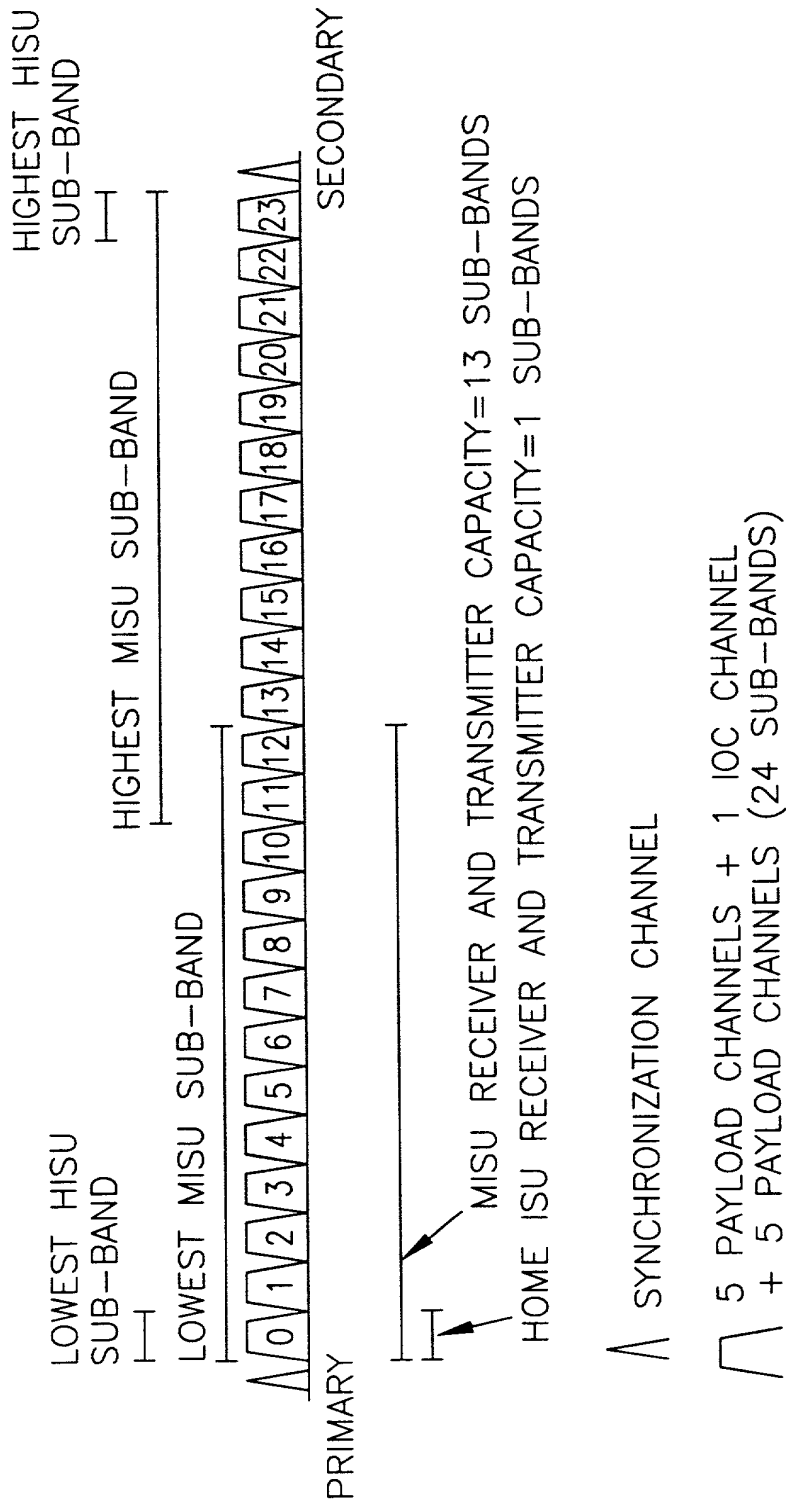


FIG. 16

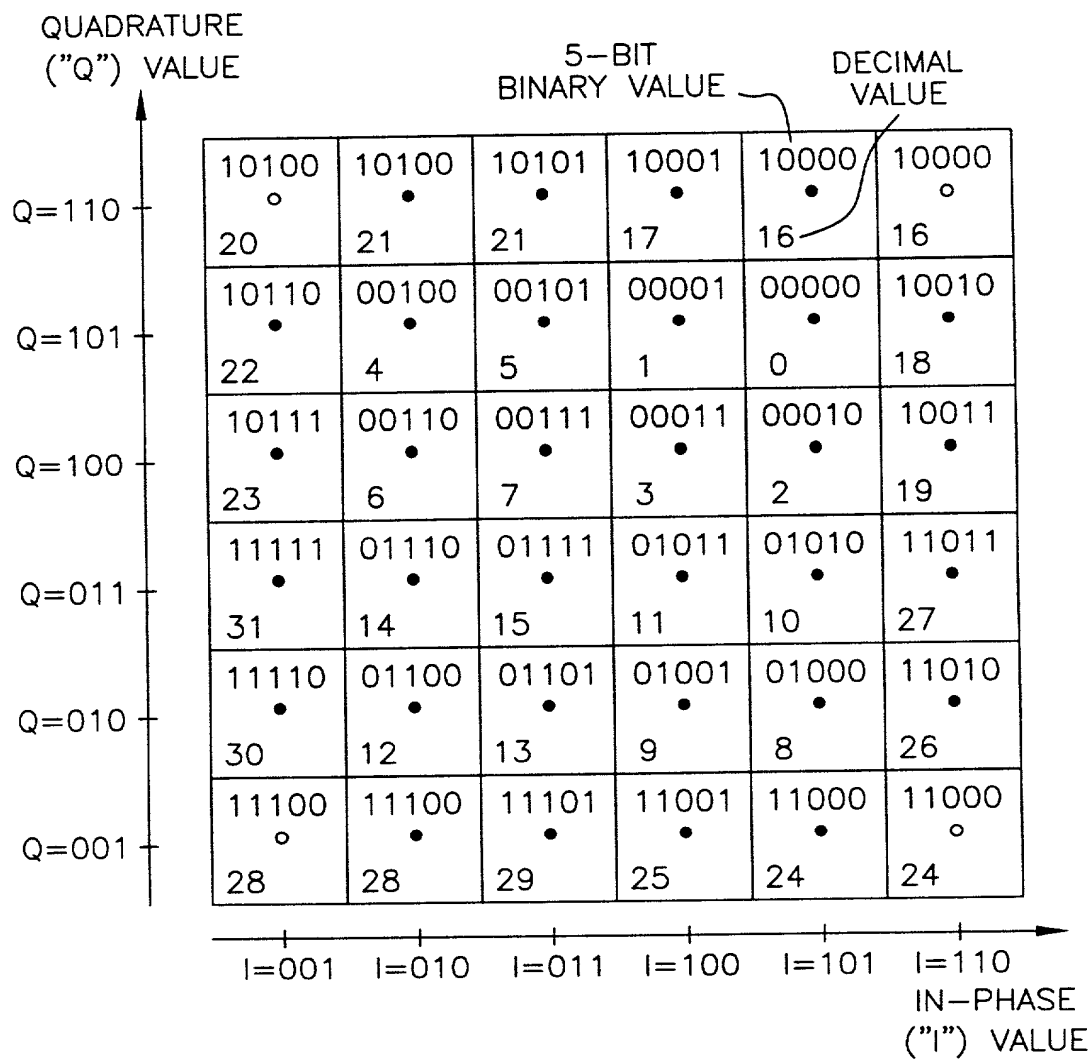


FIG. 17

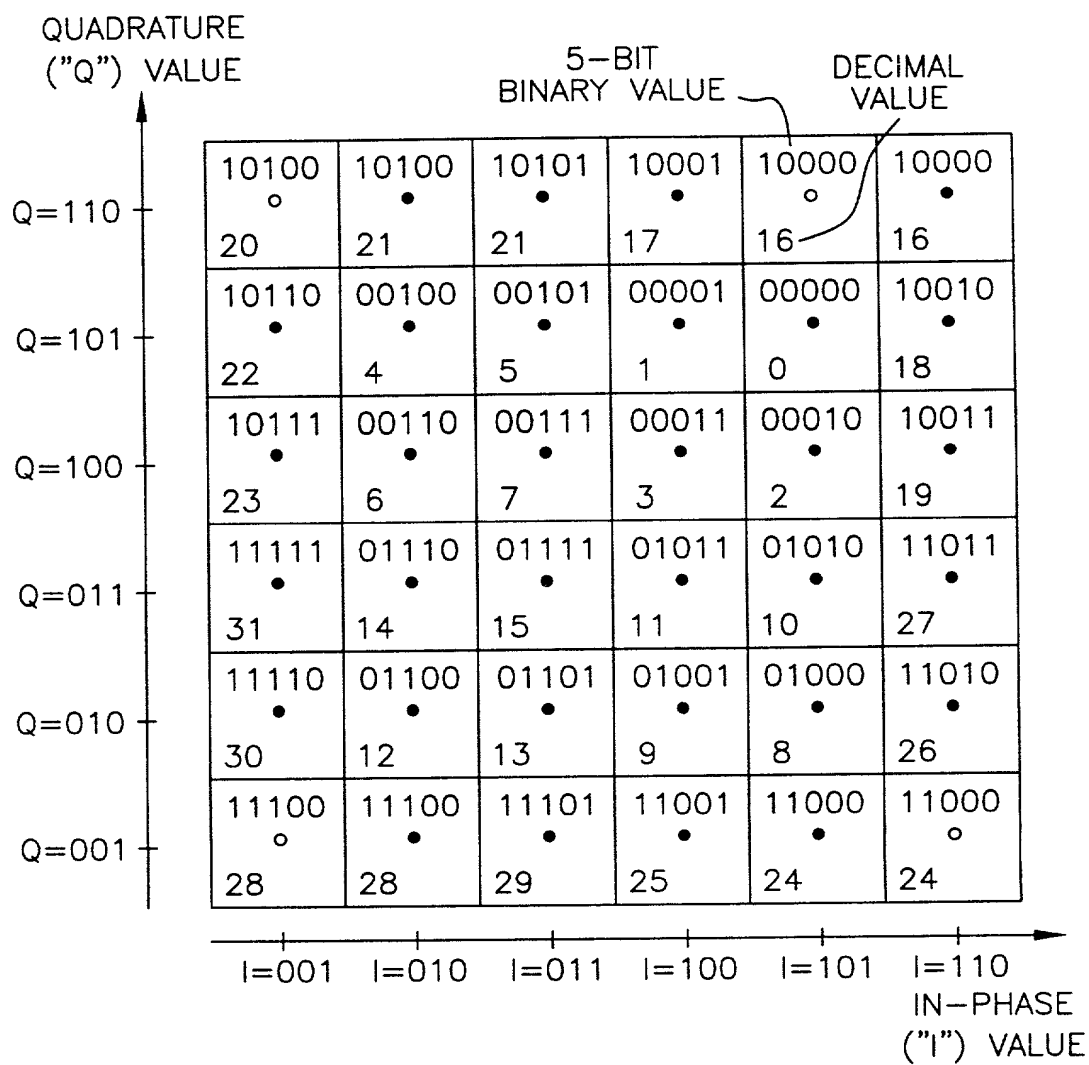


FIG. 18

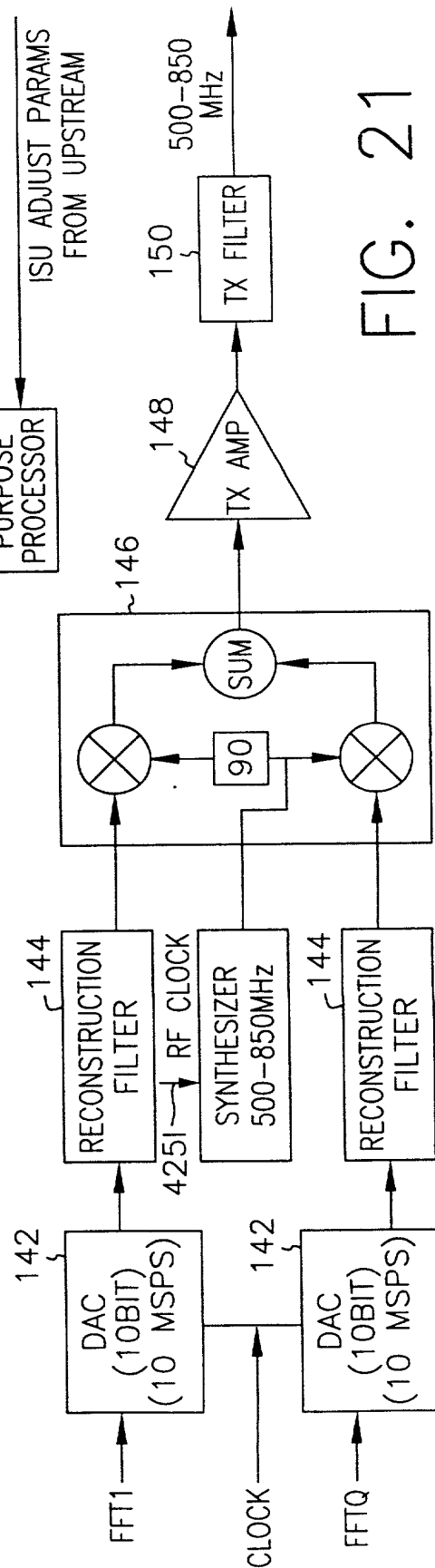
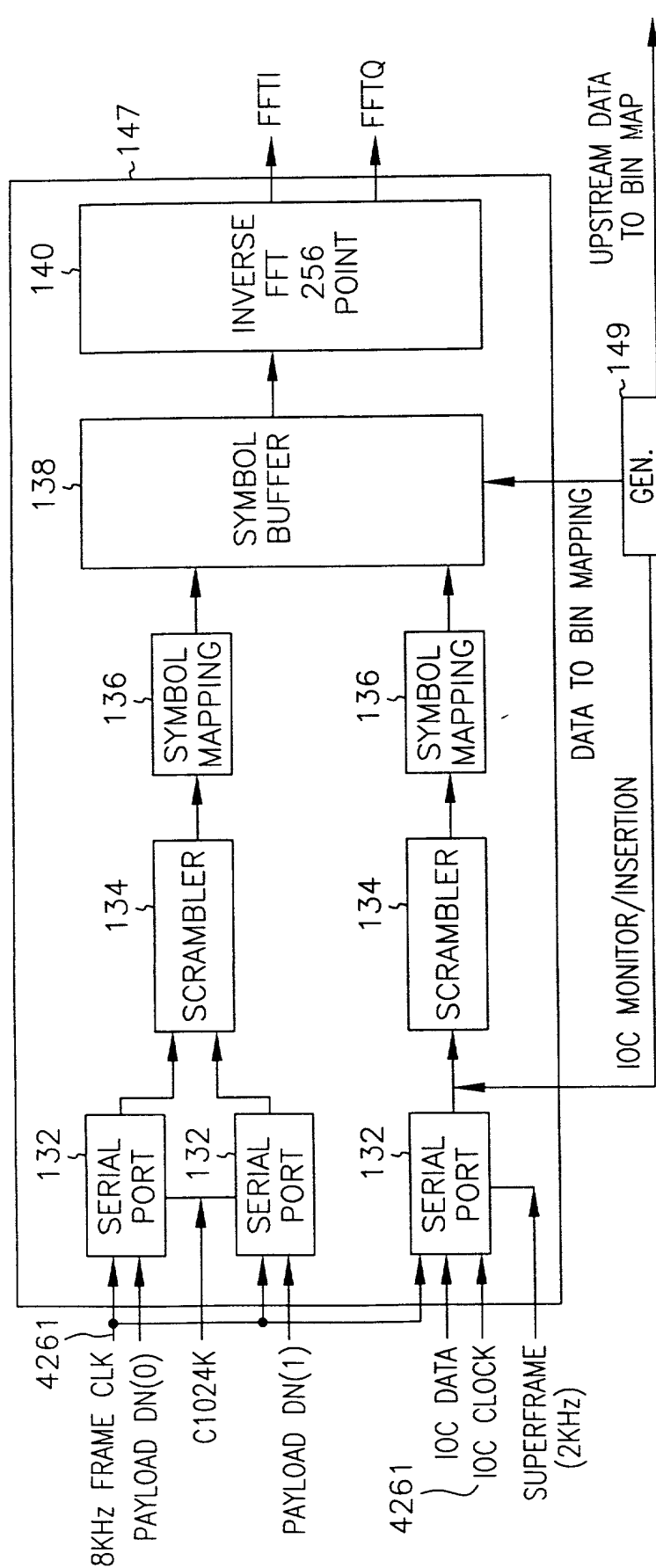


FIG. 21

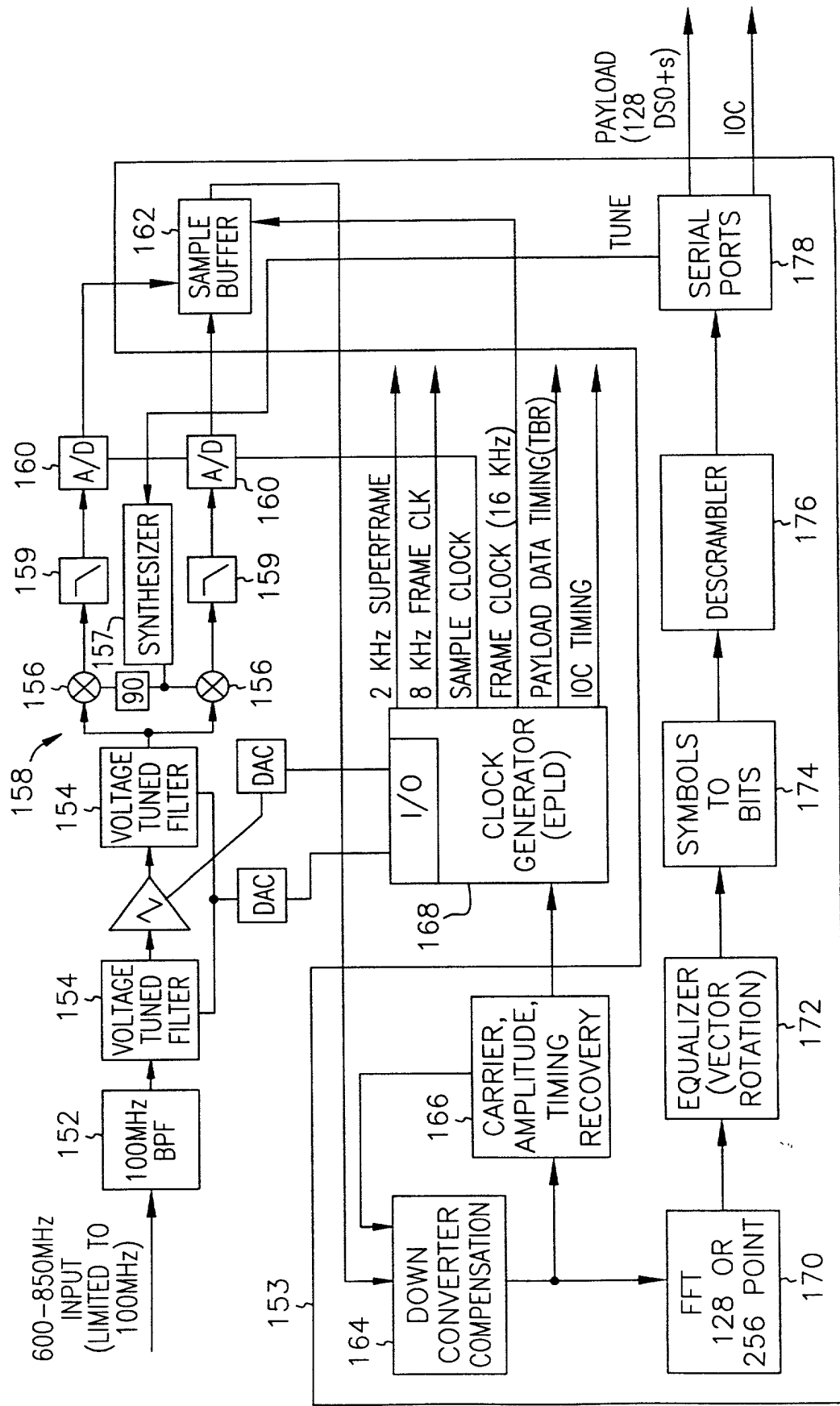


FIG. 22

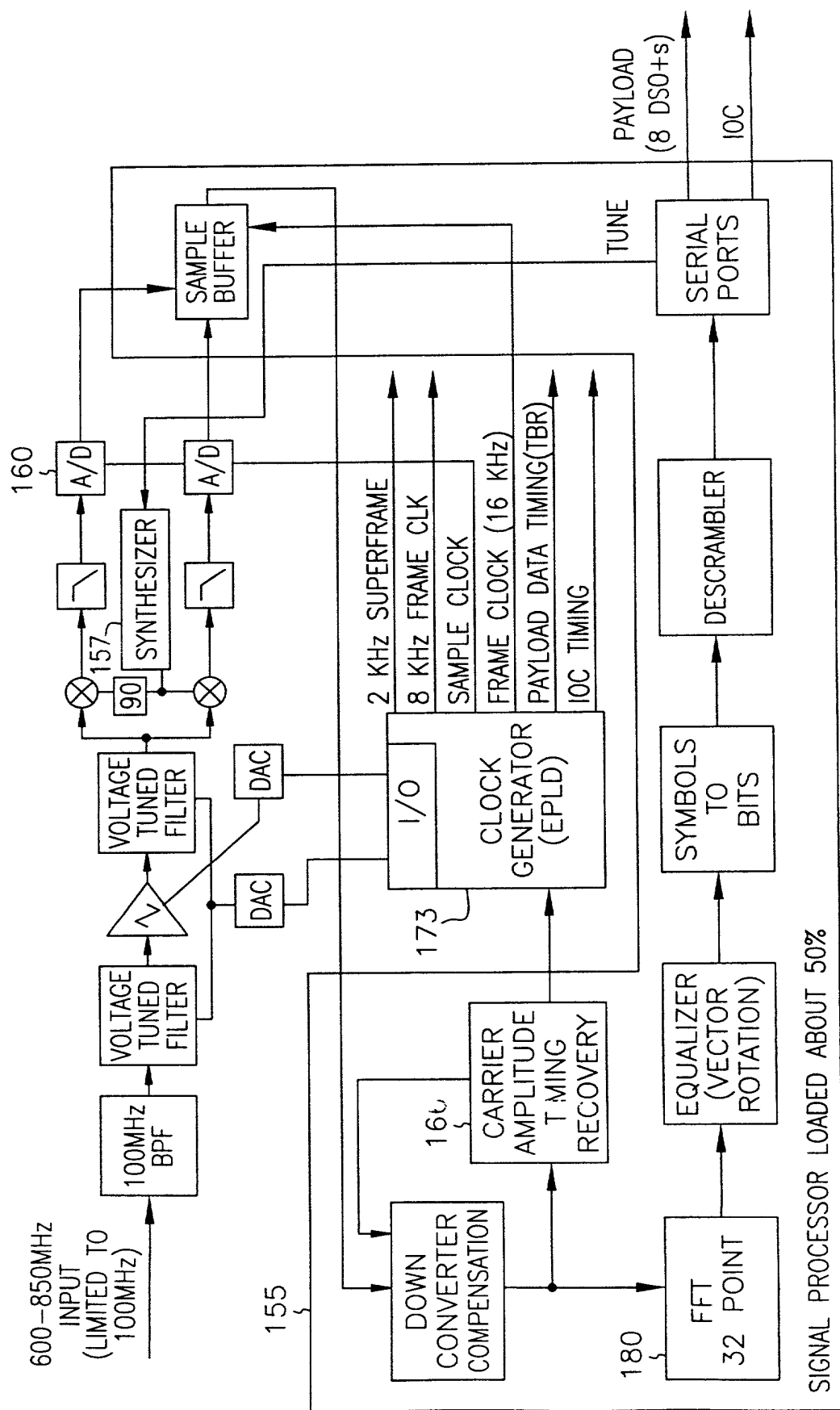


FIG. 23

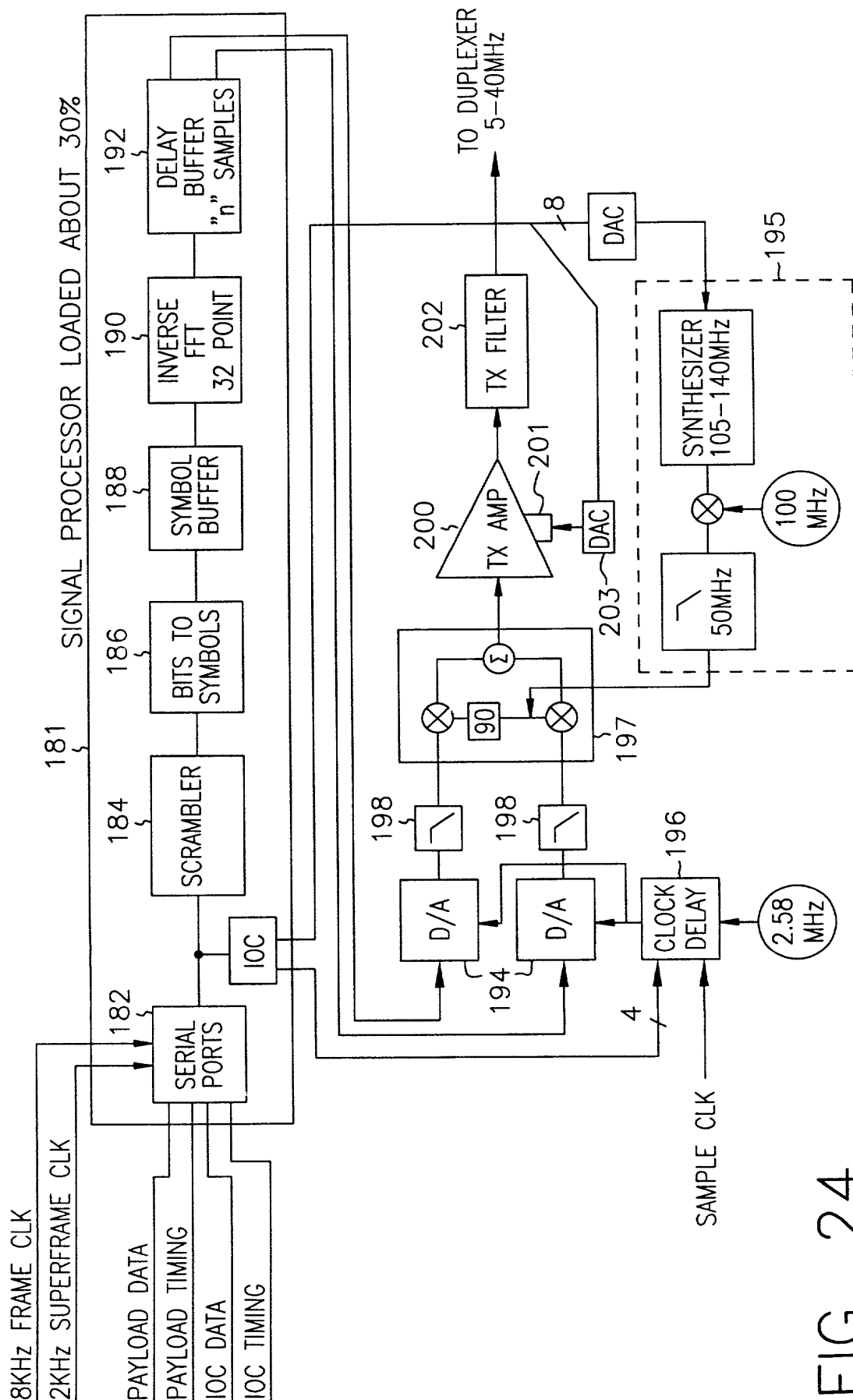
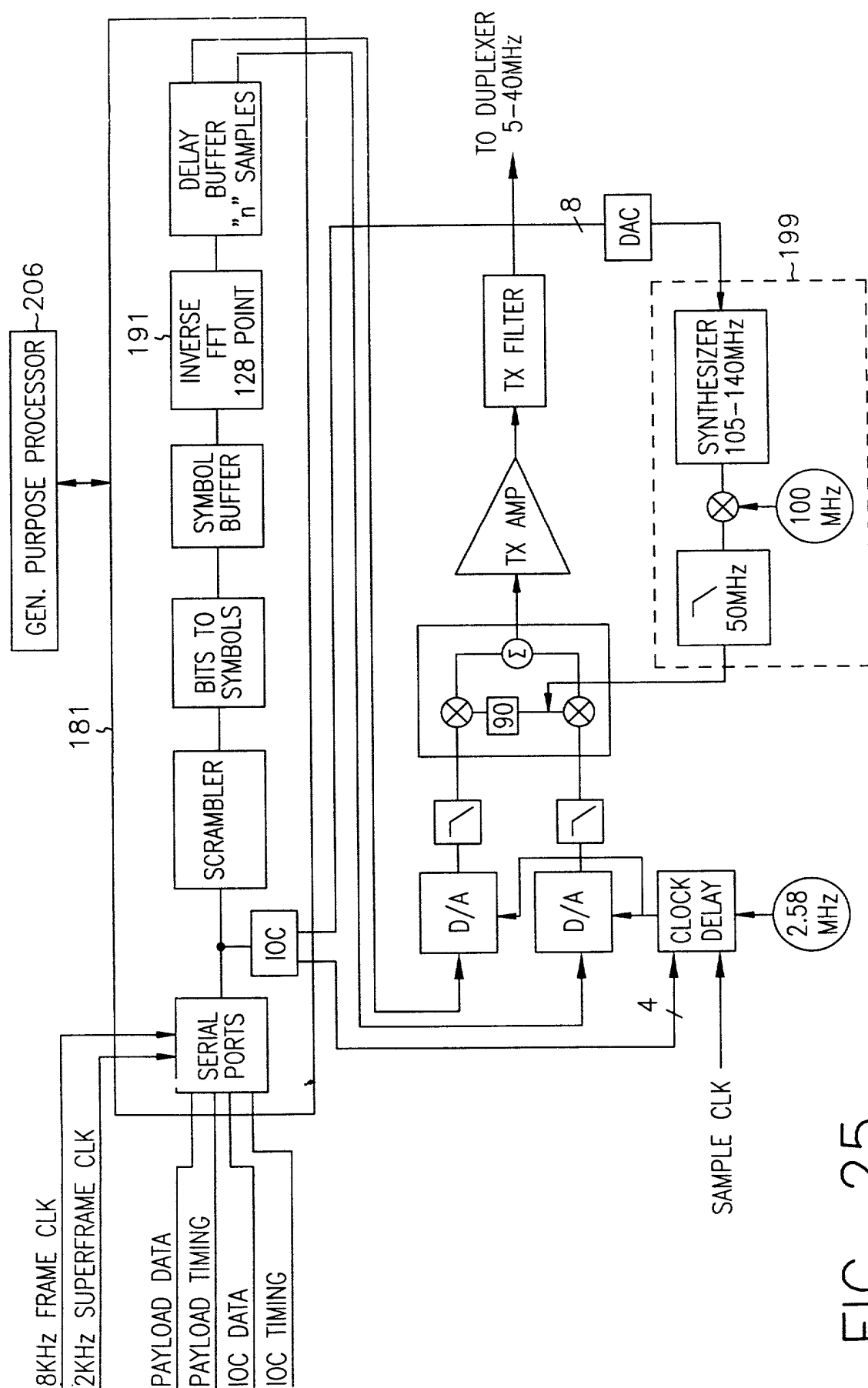


FIG. 24

Parameter	Unit	Value	Uncertainty
α	10^{-4}	0.0001	0.0001
β	10^{-4}	0.0001	0.0001
γ	10^{-4}	0.0001	0.0001
δ	10^{-4}	0.0001	0.0001
ϵ	10^{-4}	0.0001	0.0001
ζ	10^{-4}	0.0001	0.0001
η	10^{-4}	0.0001	0.0001
θ	10^{-4}	0.0001	0.0001
ι	10^{-4}	0.0001	0.0001
κ	10^{-4}	0.0001	0.0001
λ	10^{-4}	0.0001	0.0001
μ	10^{-4}	0.0001	0.0001
ν	10^{-4}	0.0001	0.0001
ξ	10^{-4}	0.0001	0.0001
\omicron	10^{-4}	0.0001	0.0001
π	10^{-4}	0.0001	0.0001
ρ	10^{-4}	0.0001	0.0001
σ	10^{-4}	0.0001	0.0001
τ	10^{-4}	0.0001	0.0001
υ	10^{-4}	0.0001	0.0001
ϕ	10^{-4}	0.0001	0.0001
χ	10^{-4}	0.0001	0.0001
ψ	10^{-4}	0.0001	0.0001
ω	10^{-4}	0.0001	0.0001
φ	10^{-4}	0.0001	0.0001
ϑ	10^{-4}	0.0001	0.0001
ϖ	10^{-4}	0.0001	0.0001
ς	10^{-4}	0.0001	0.0001
η	10^{-4}	0.0001	0.0001
θ	10^{-4}	0.0001	0.0001
ι	10^{-4}	0.0001	0.0001
κ	10^{-4}	0.0001	0.0001
λ	10^{-4}	0.0001	0.0001
μ	10^{-4}	0.0001	0.0001
ν	10^{-4}	0.0001	0.0001
ξ	10^{-4}	0.0001	0.0001
\omicron	10^{-4}	0.0001	0.0001
π	10^{-4}	0.0001	0.0001
ρ	10^{-4}	0.0001	0.0001
σ	10^{-4}	0.0001	0.0001
τ	10^{-4}	0.0001	0.0001
υ	10^{-4}	0.0001	0.0001
ϕ	10^{-4}	0.0001	0.0001
χ	10^{-4}	0.0001	0.0001
ψ	10^{-4}	0.0001	0.0001
ω	10^{-4}	0.0001	0.0001
φ	10^{-4}	0.0001	0.0001
ϑ	10^{-4}	0.0001	0.0001
ϖ	10^{-4}	0.0001	0.0001
ς	10^{-4}	0.0001	0.0001
η	10^{-4}	0.0001	0.0001
θ	10^{-4}	0.0001	0.0001
ι	10^{-4}	0.0001	0.0001
κ	10^{-4}	0.0001	0.0001
λ	10^{-4}	0.0001	0.0001
μ	10^{-4}	0.0001	0.0001
ν	10^{-4}	0.0001	0.0001
ξ	10^{-4}	0.0001	0.0001
\omicron	10^{-4}	0.0001	0.0001
π	10^{-4}	0.0001	0.0001
ρ	10^{-4}	0.0001	0.0001
σ	10^{-4}	0.0001	0.0001
τ	10^{-4}	0.0001	0.0001
υ	10^{-4}	0.0001	0.0001
ϕ	10^{-4}	0.0001	0.0001
χ	10^{-4}	0.0001	0.0001
ψ	10^{-4}	0.0001	0.0001
ω	10^{-4}	0.0001	0.0001
φ	10^{-4}	0.0001	0.0001
ϑ	10^{-4}	0.0001	0.0001
ϖ	10^{-4}	0.0001	0.0001
ς	10^{-4}	0.0001	0.00



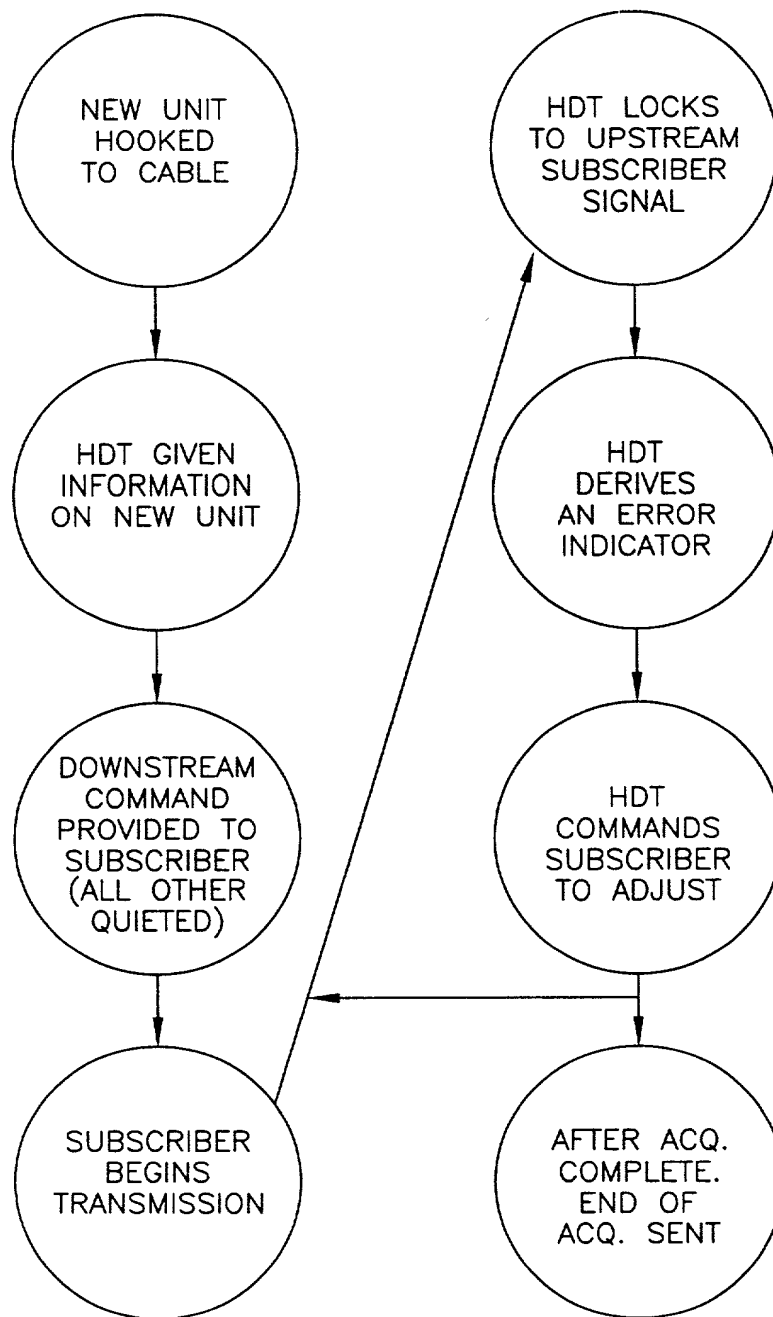


FIG. 27

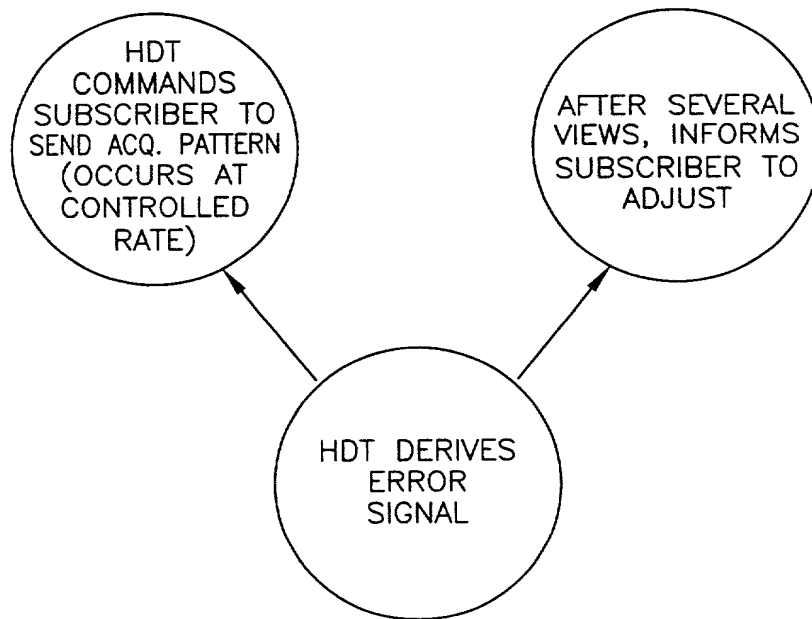


FIG. 28

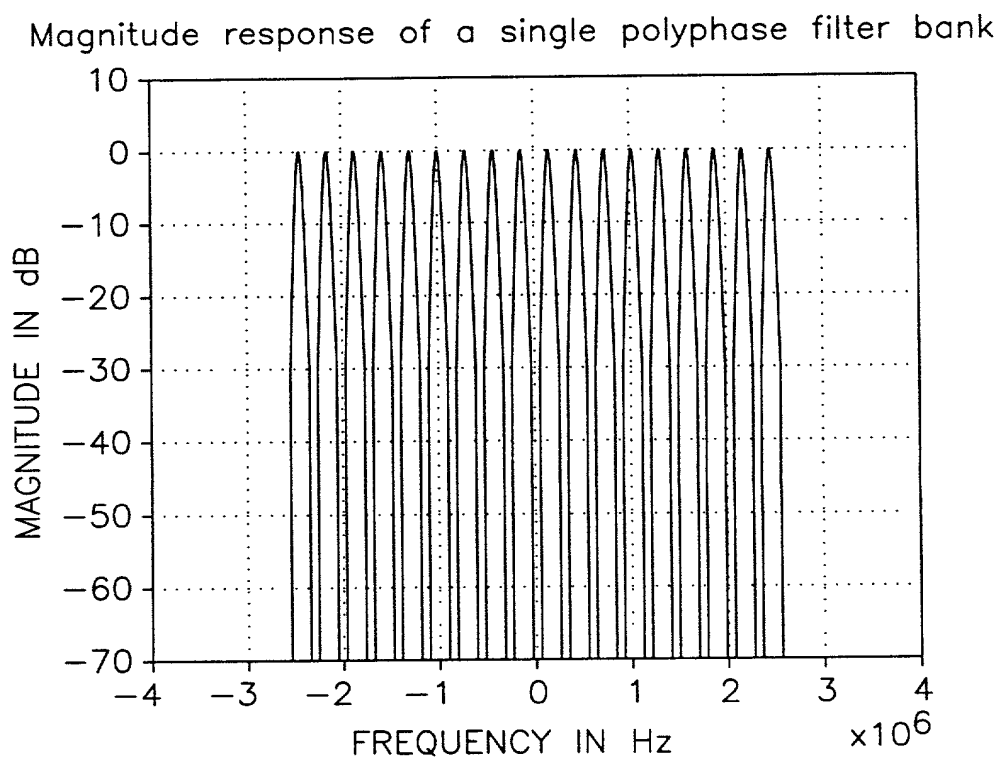


FIG. 29

Magnitude response of a single polyphase filter bank

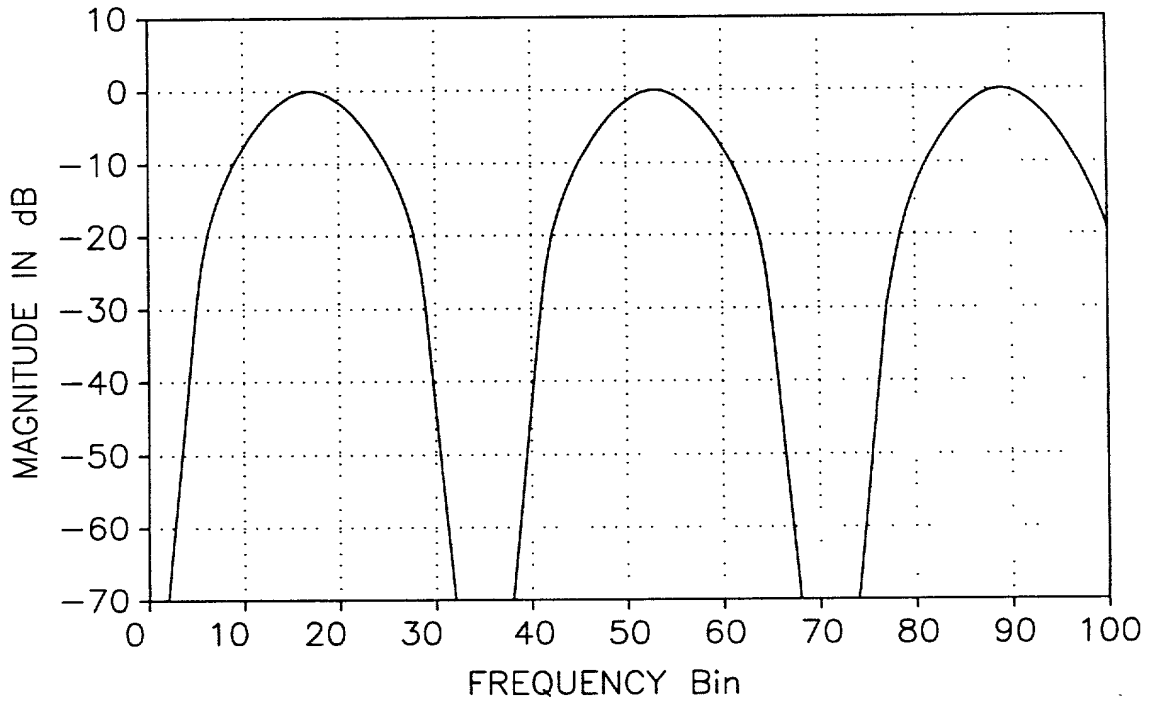


FIG. 30

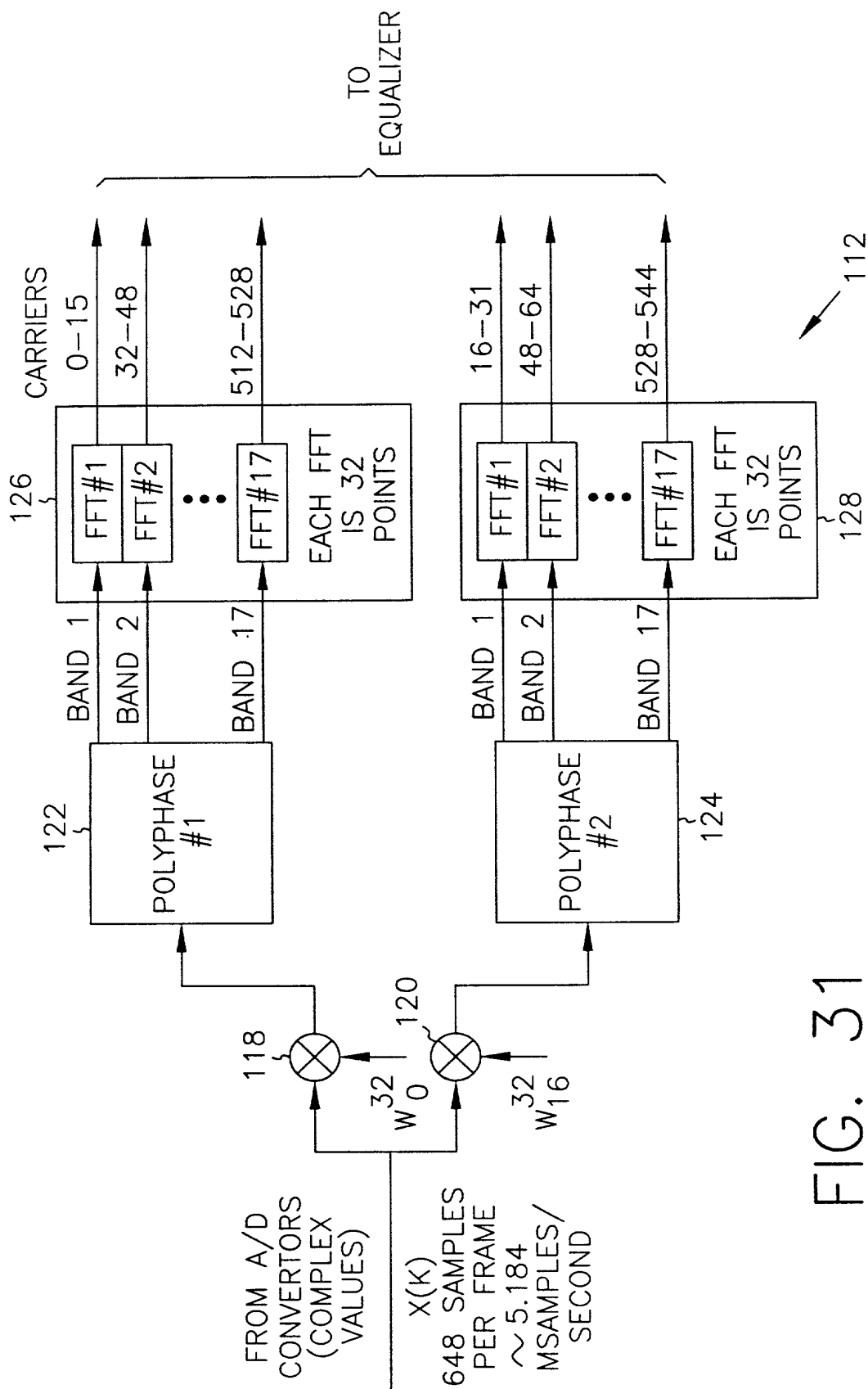


FIG. 31

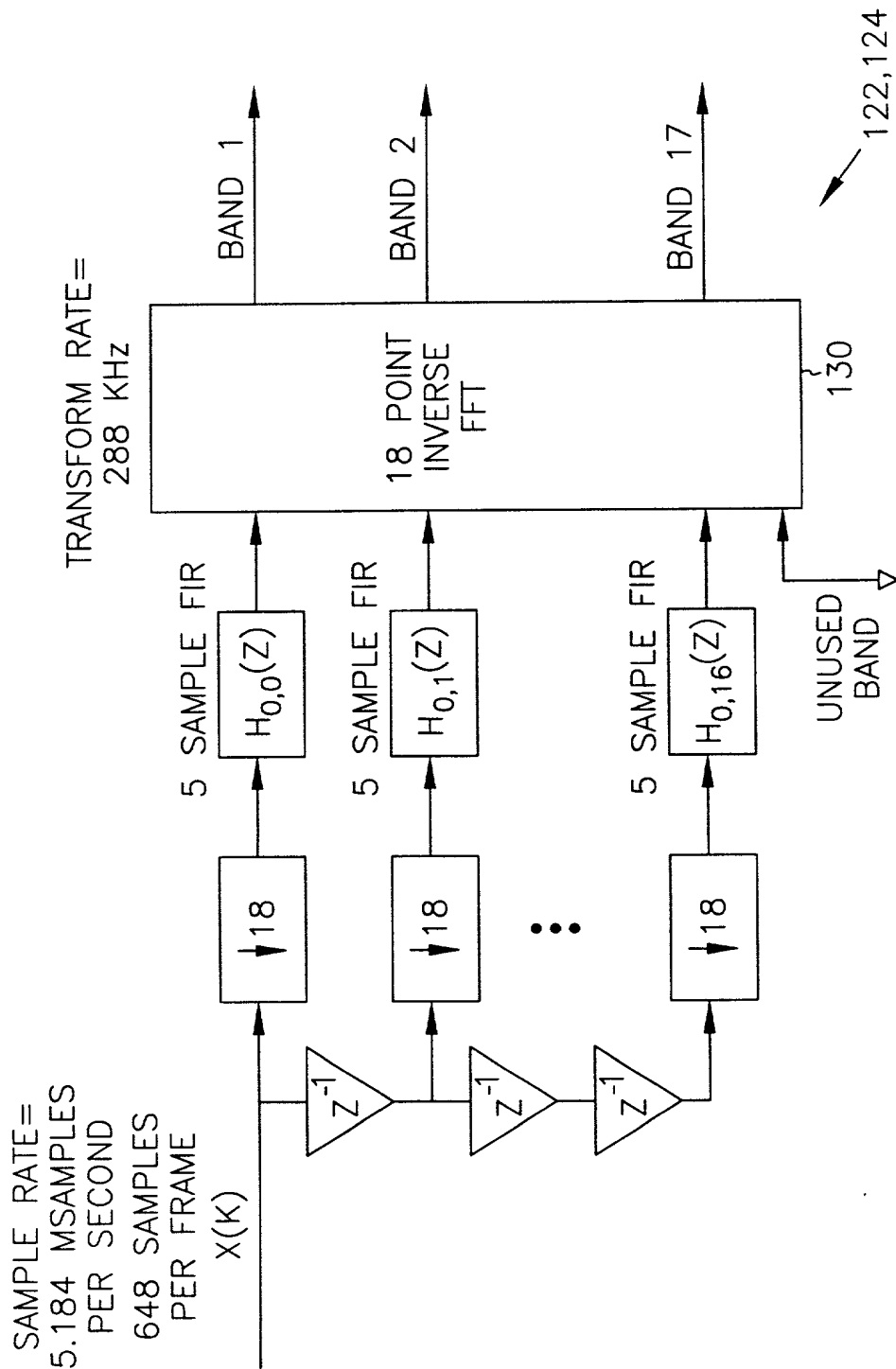
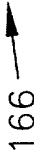
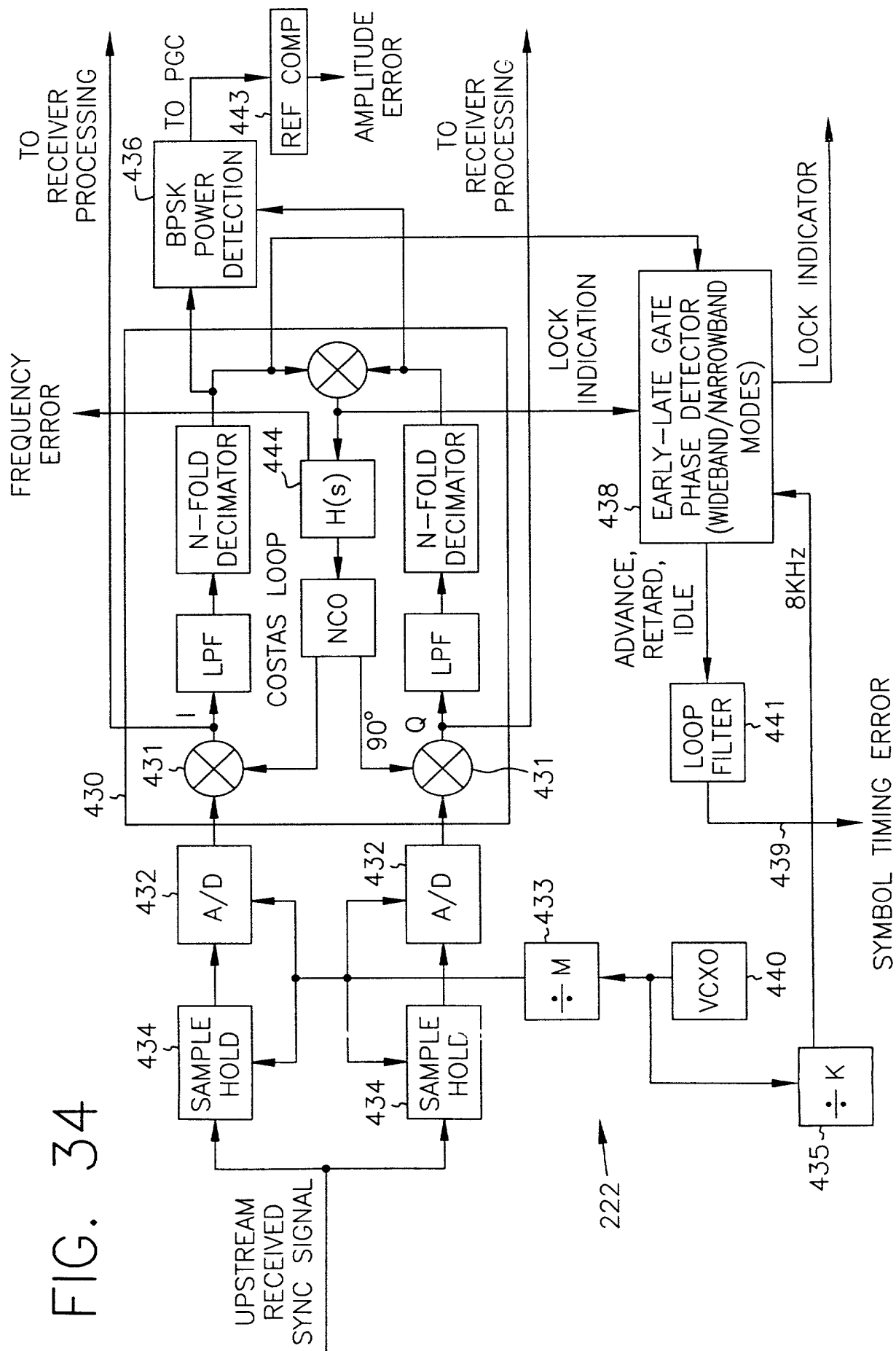


FIG. 32

[illegible]



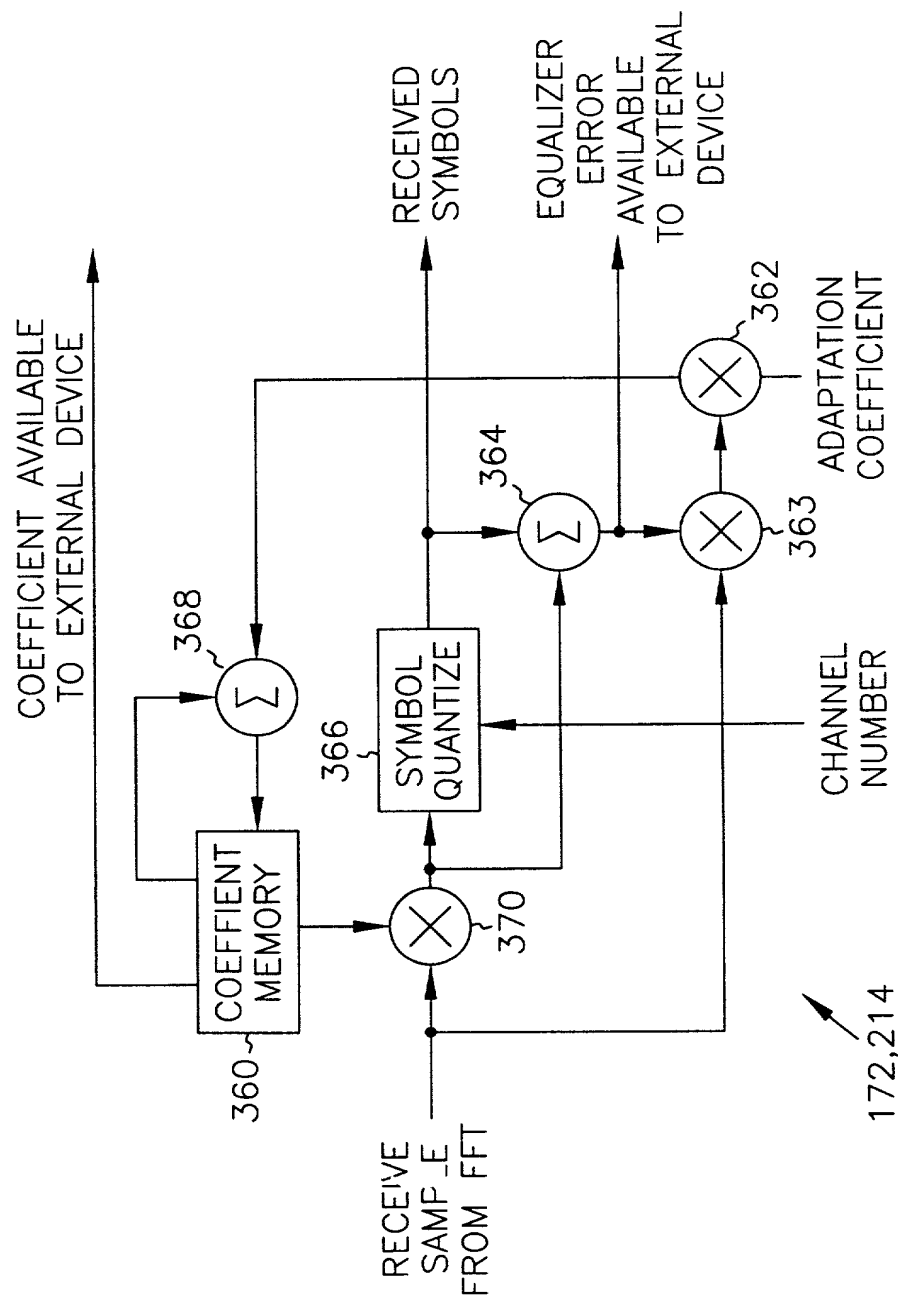


FIG. 35

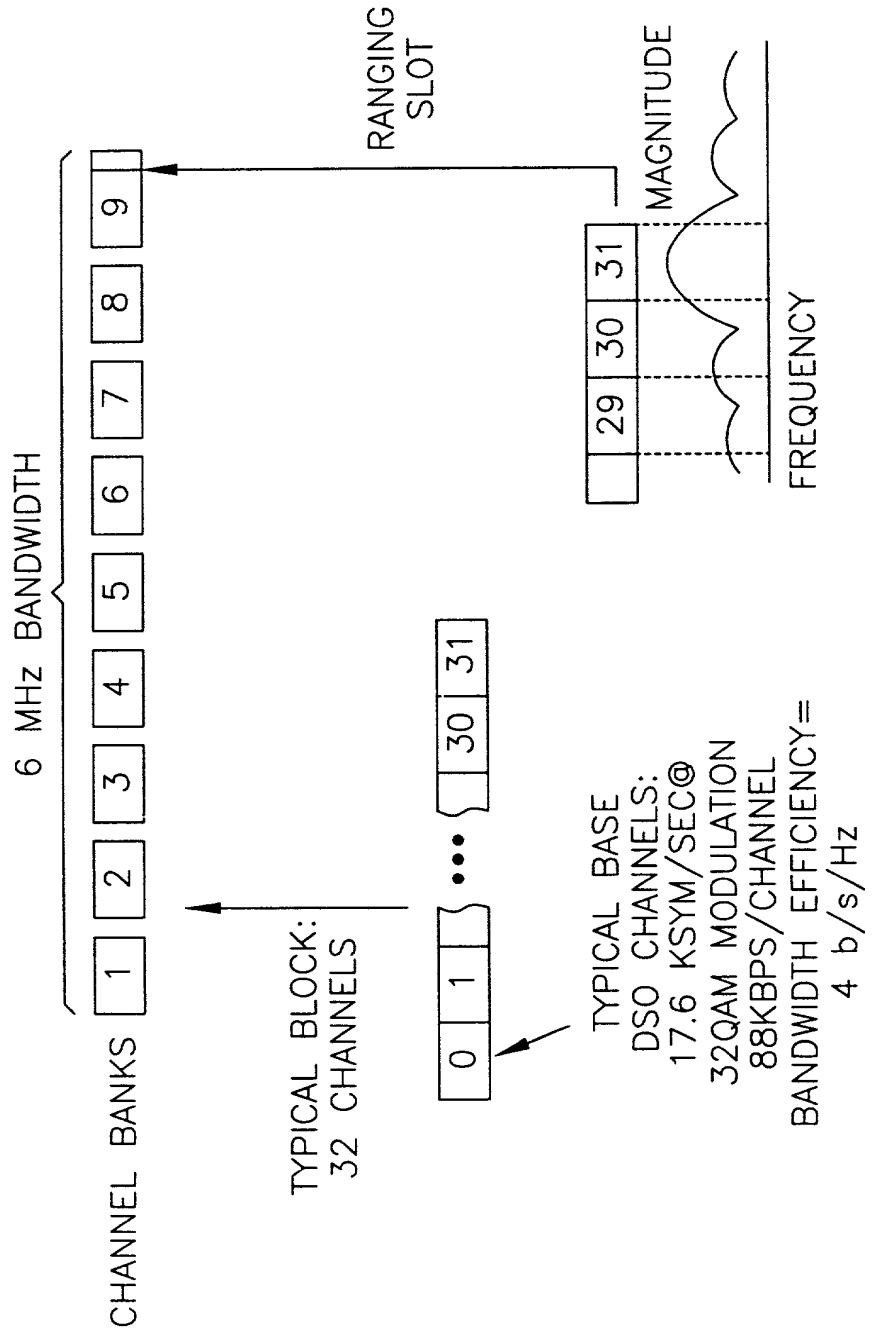


FIG. 36

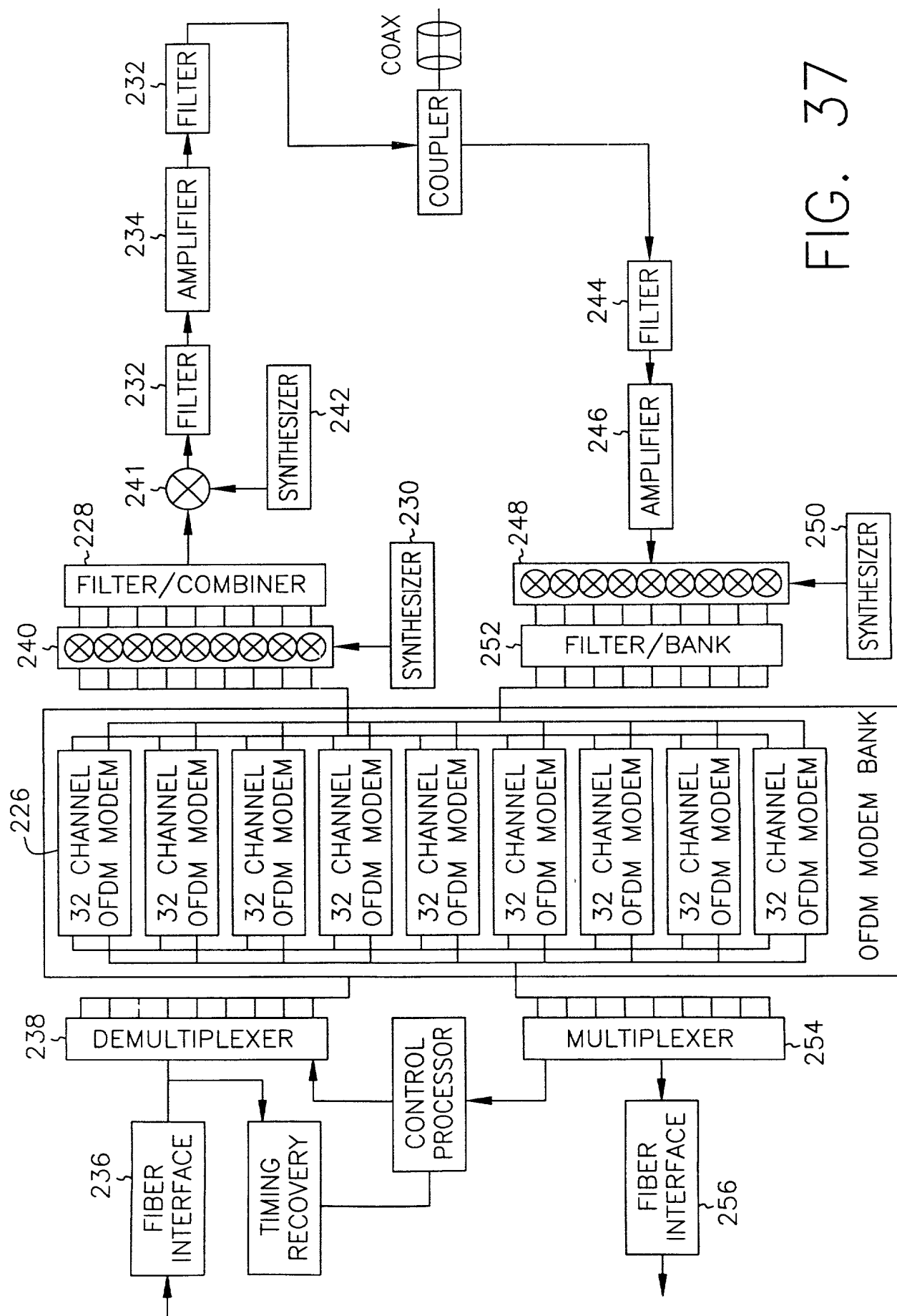


FIG. 37

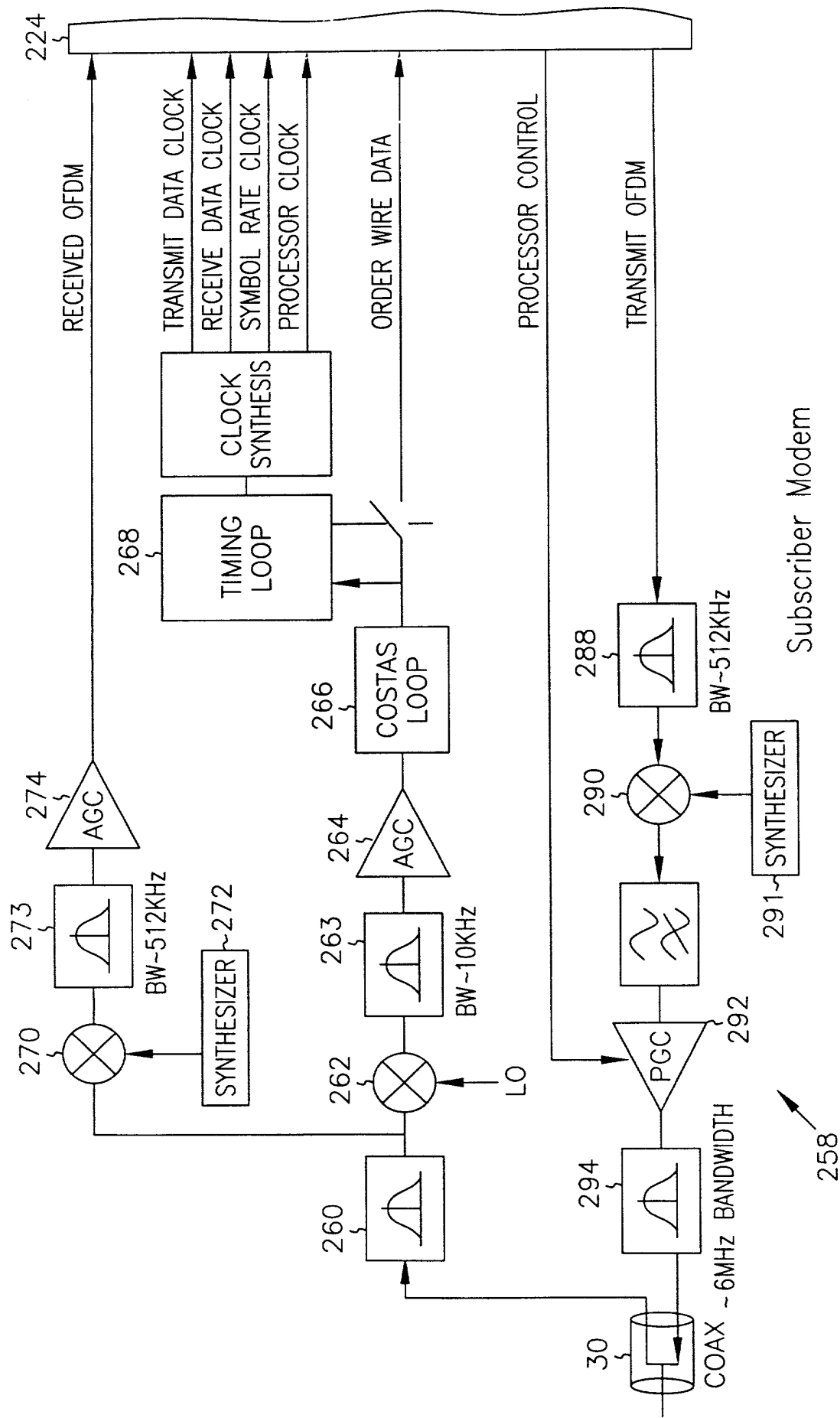


FIG. 38

Subscriber Modem

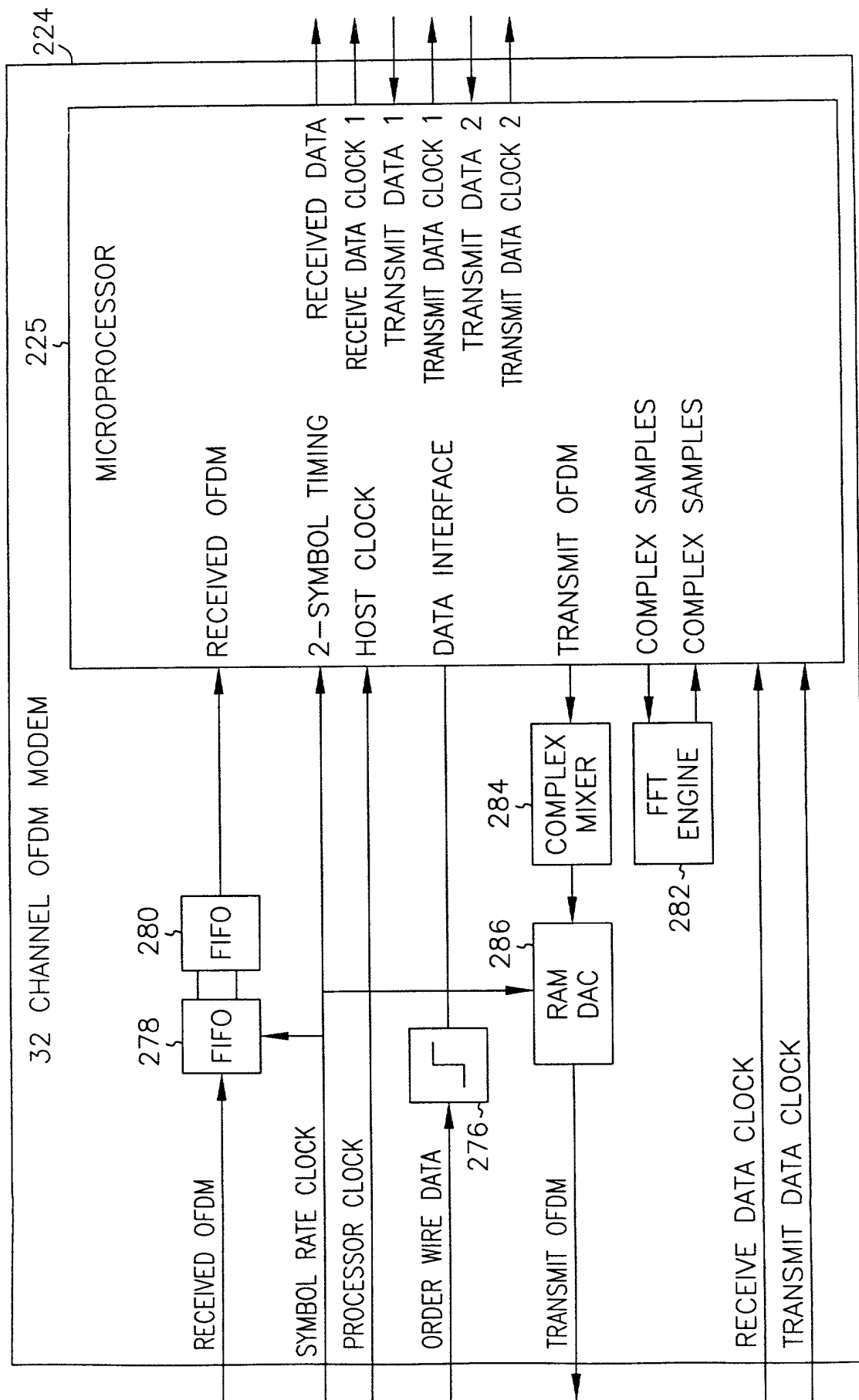


FIG. 39

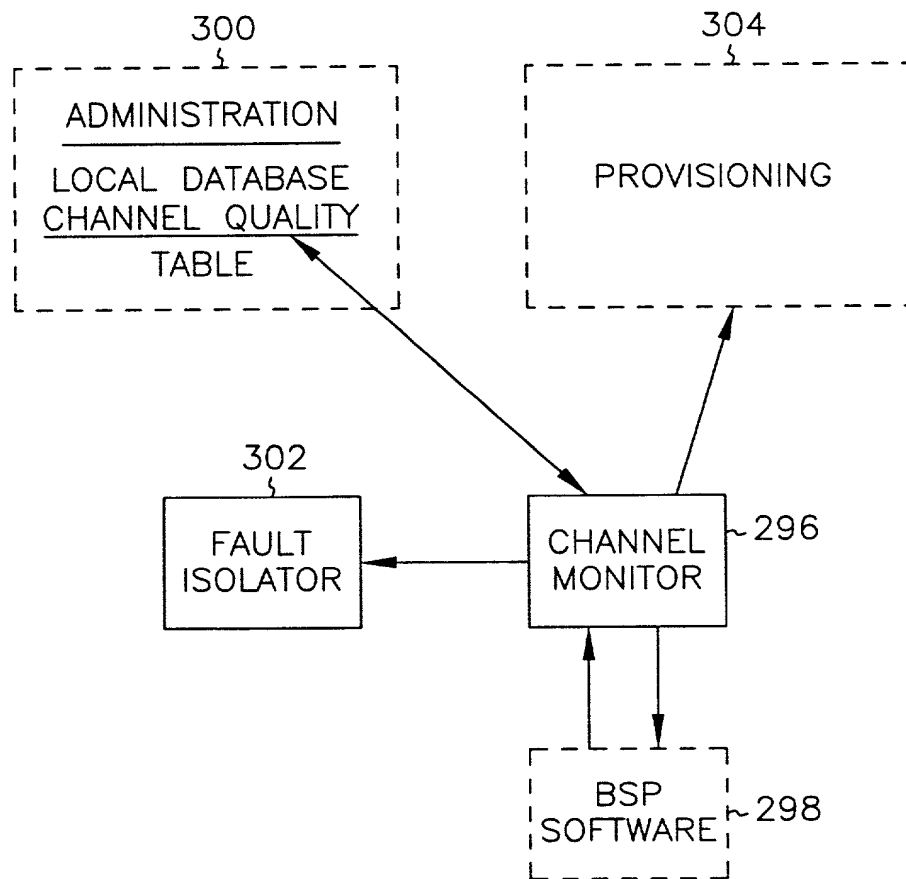


FIG. 40

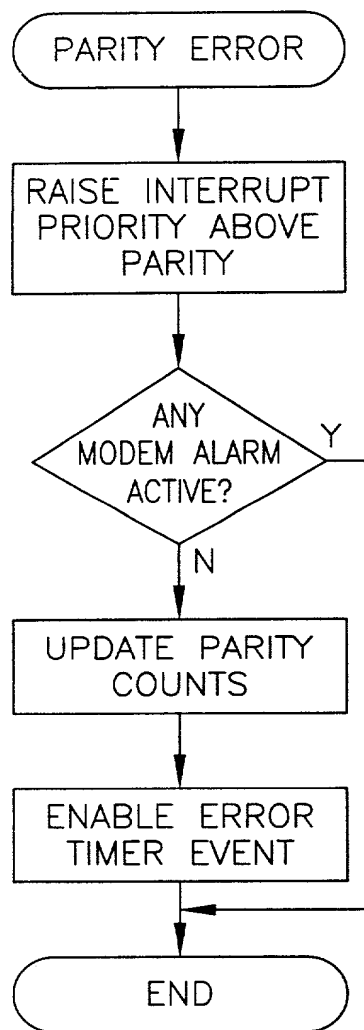


FIG. 41

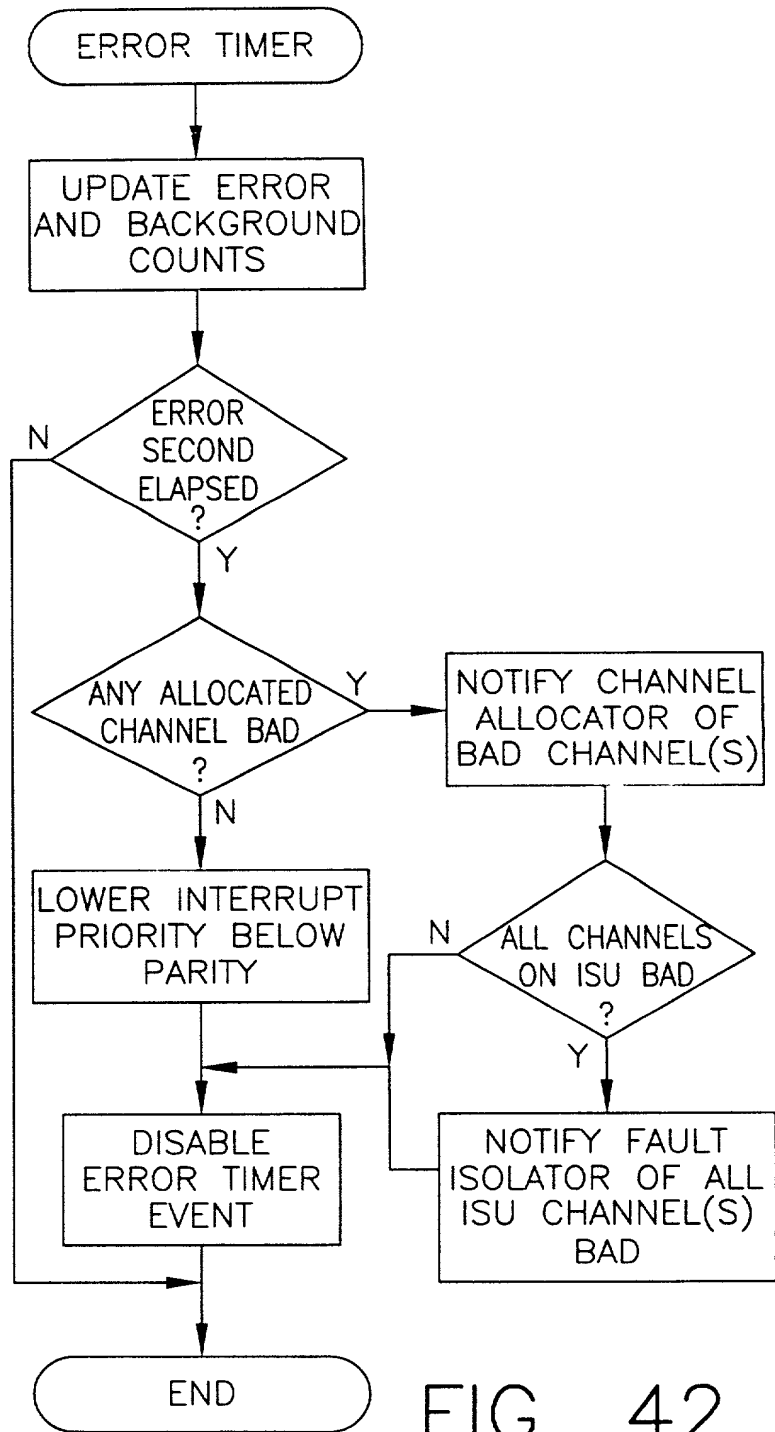


FIG. 42

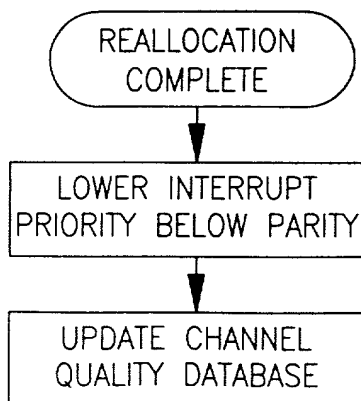
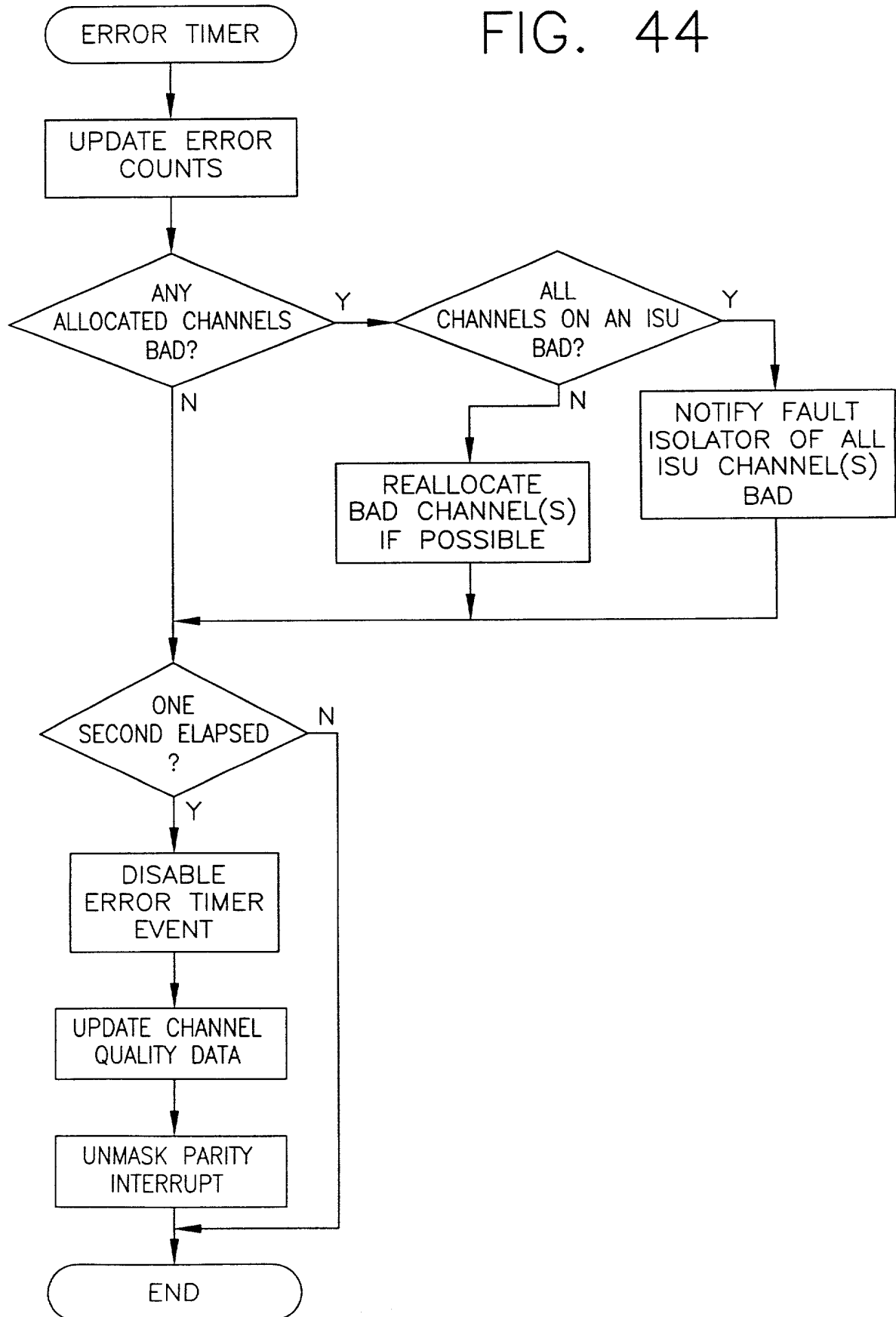


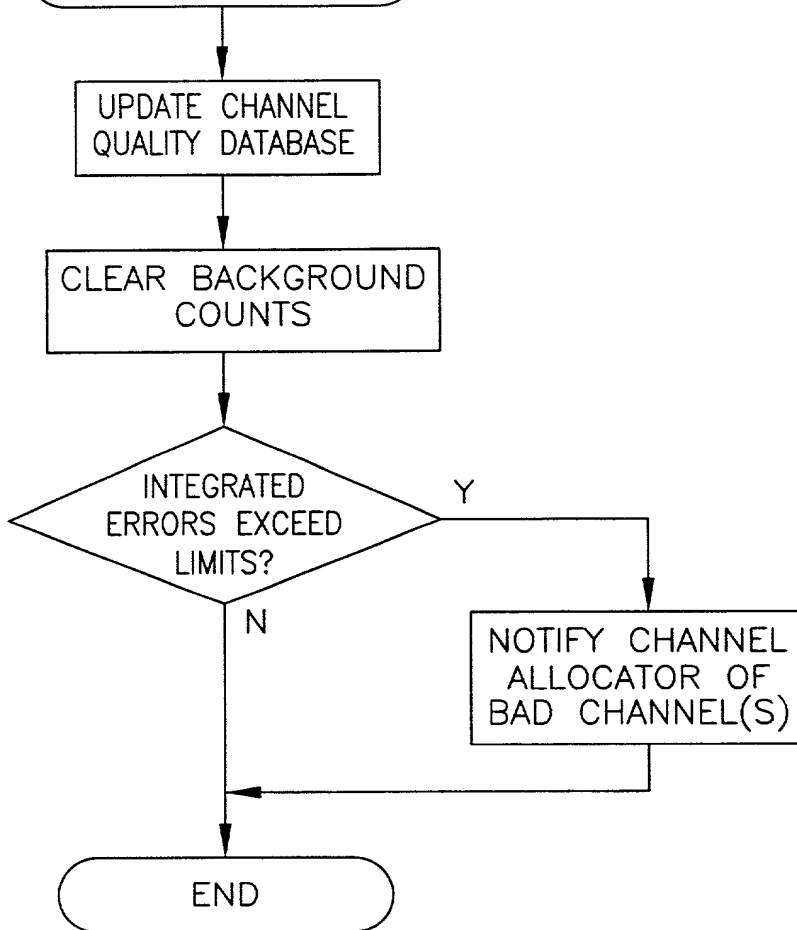
FIG. 43

FIG. 44



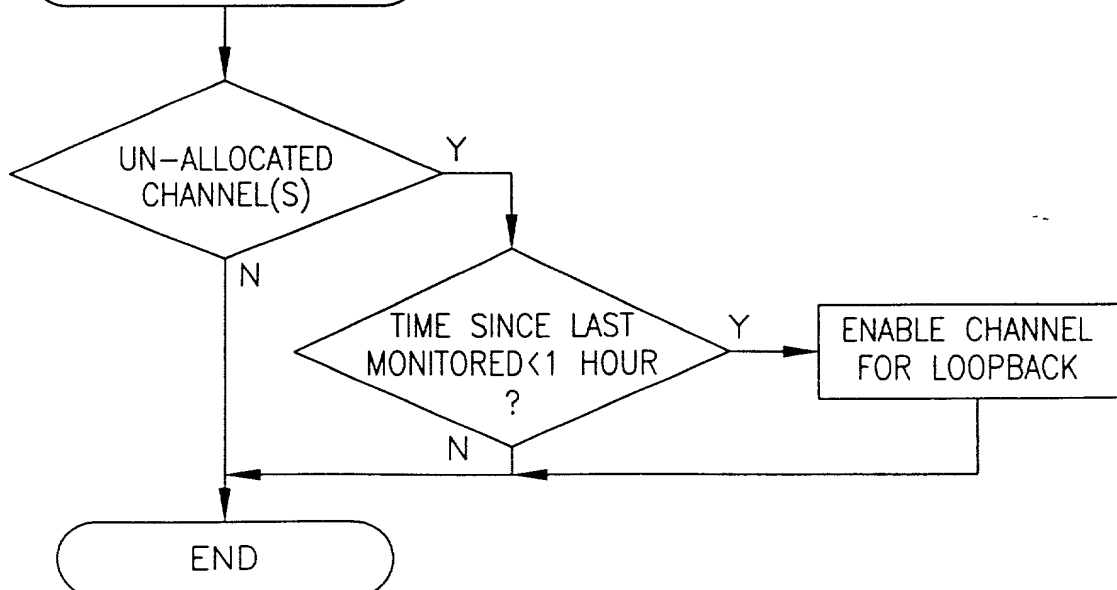
BACKGROUND TIMER

FIG. 45



BACKGROUND TIMER

FIG. 46



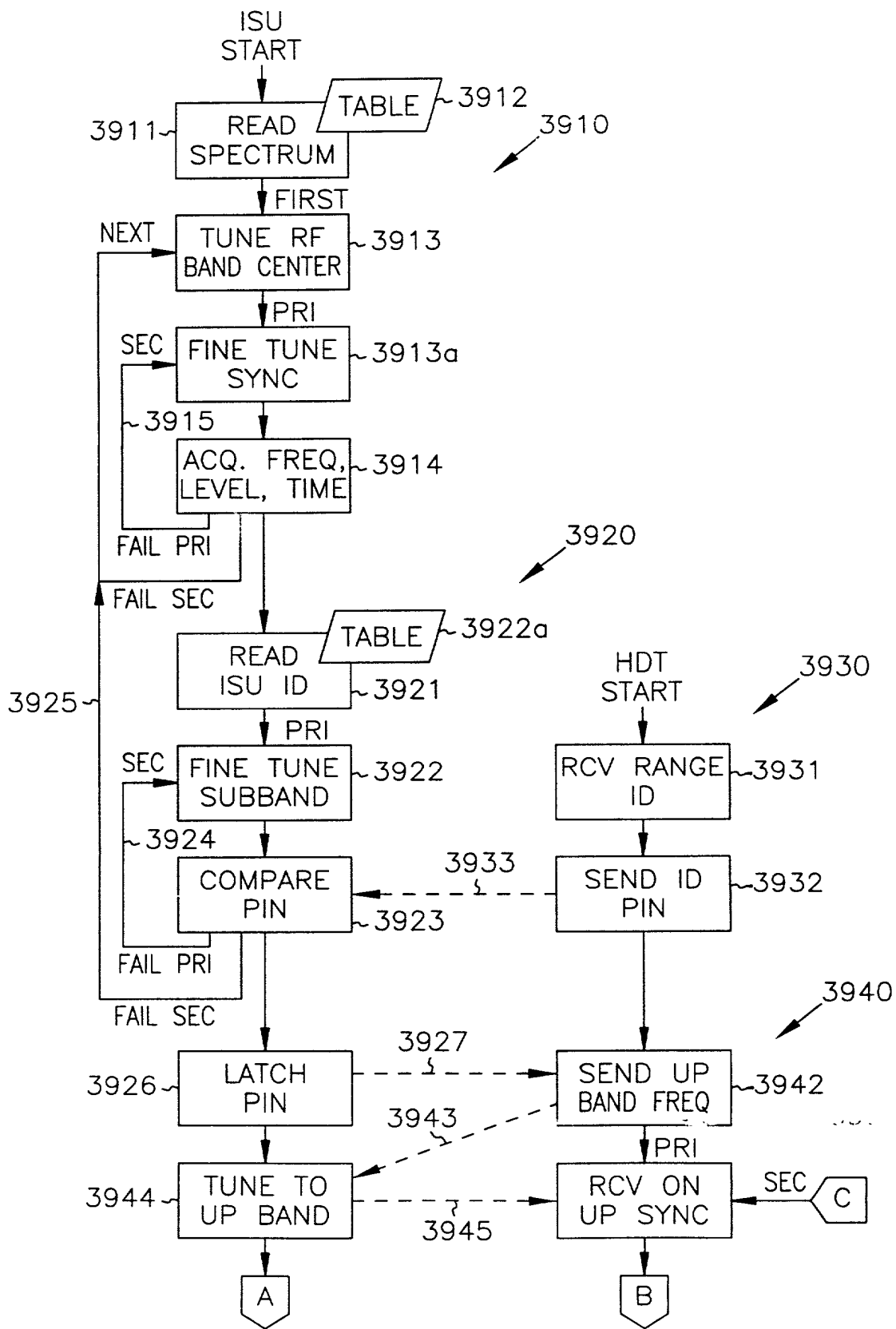
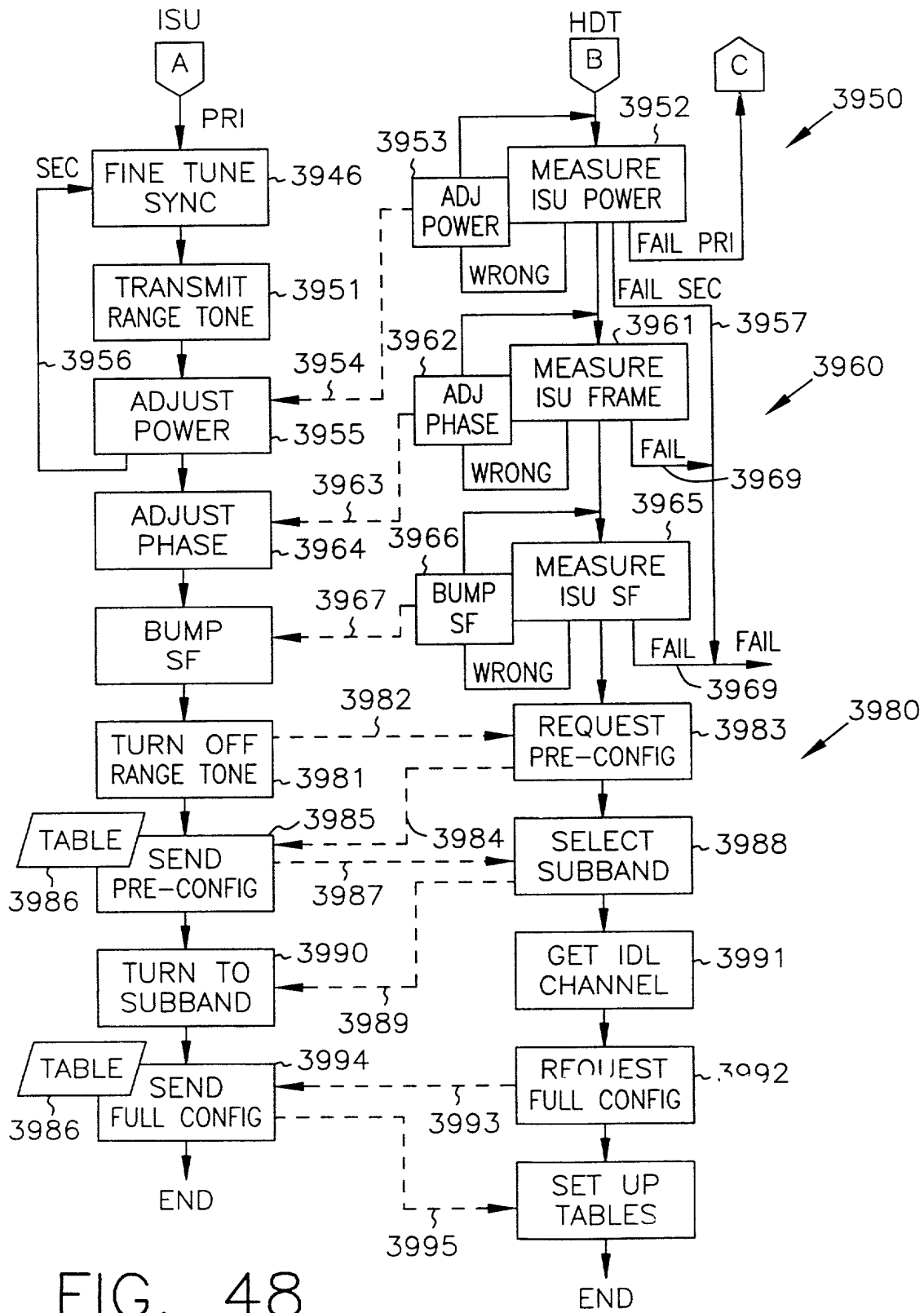


FIG. 47



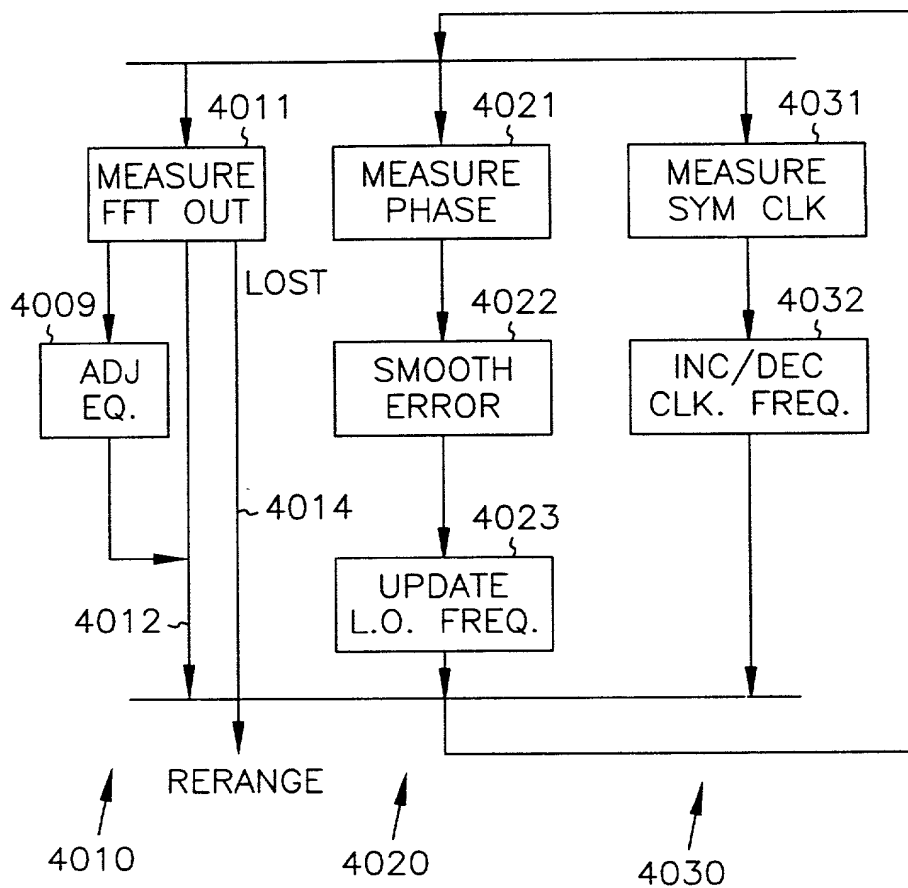


FIG. 49

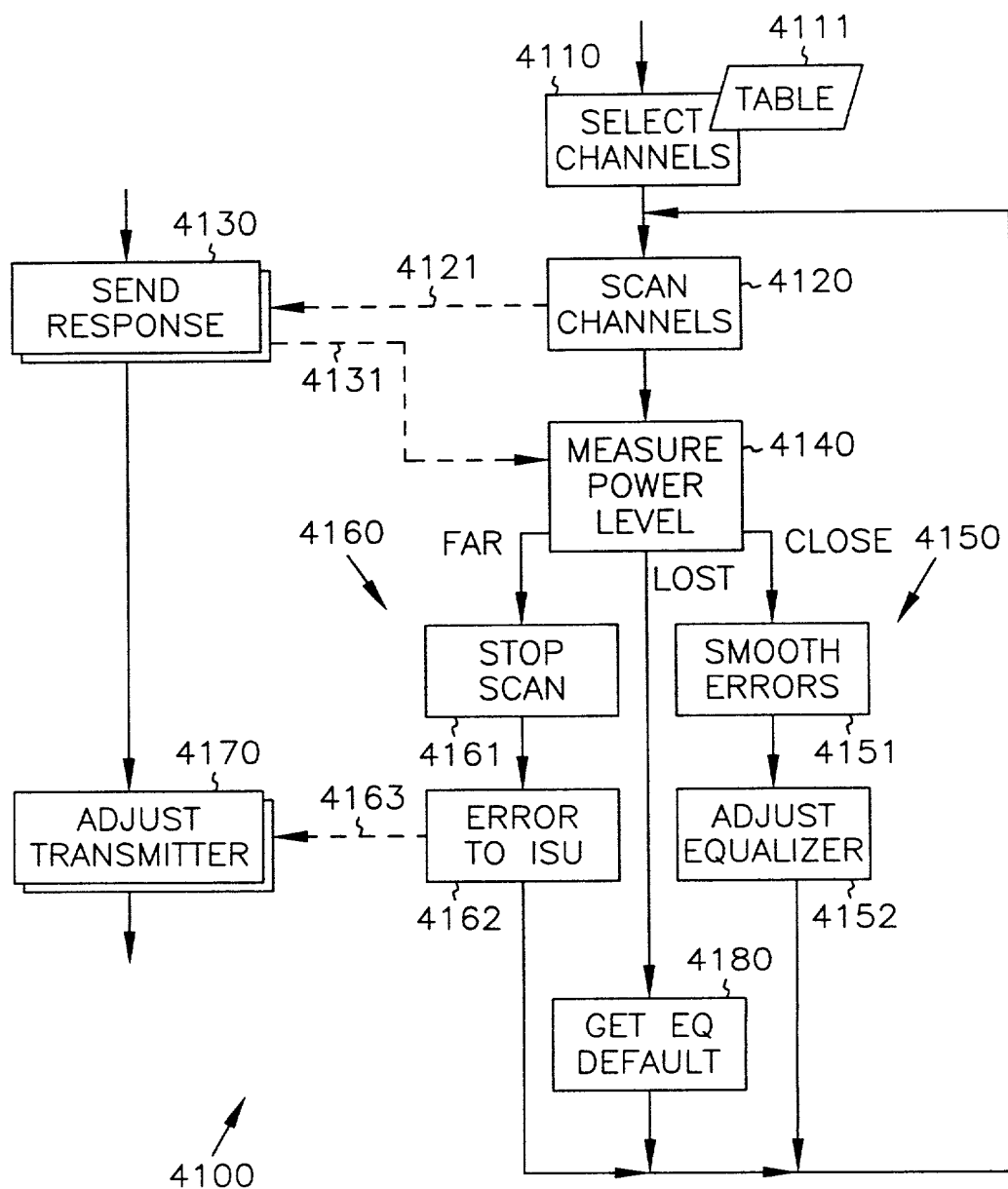


FIG. 50

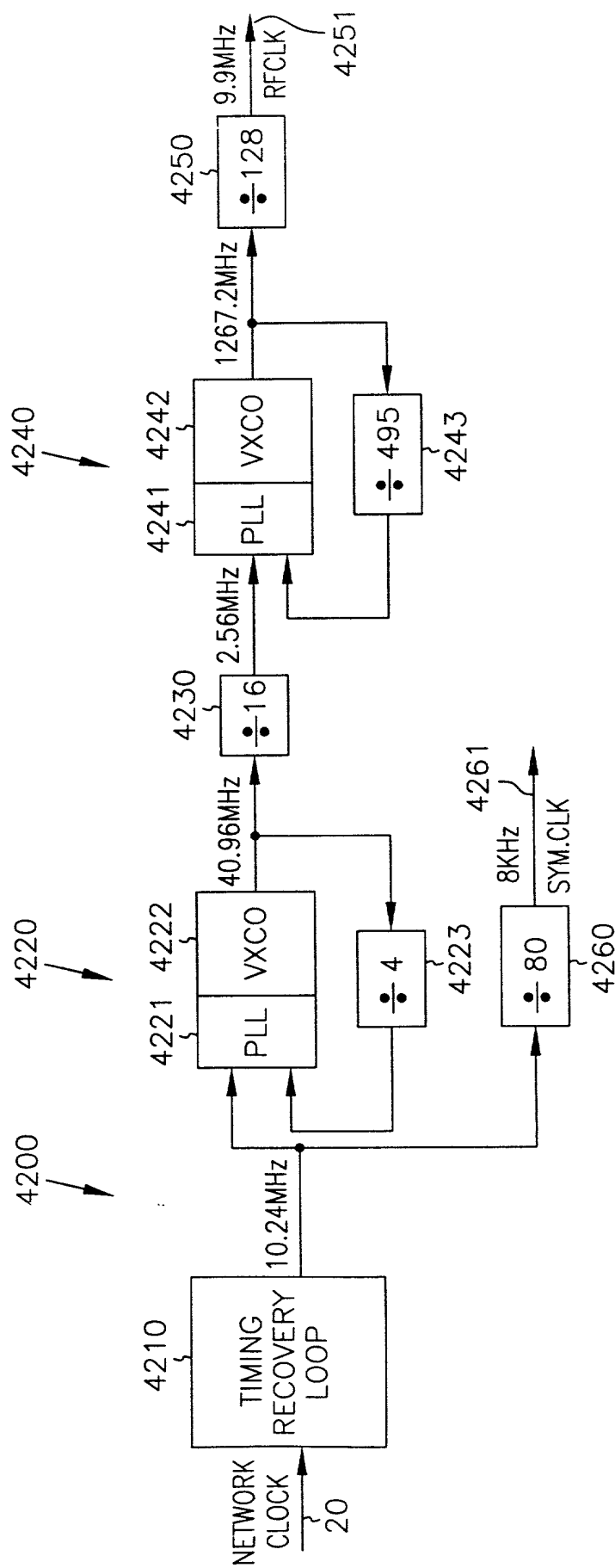


FIG. 51

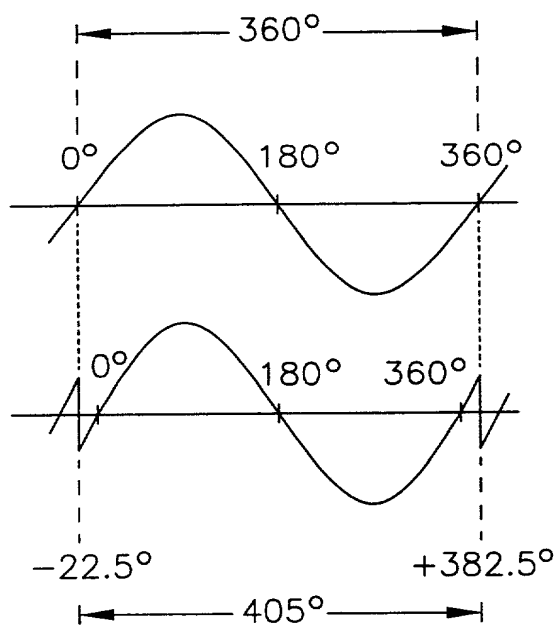


FIG. 52

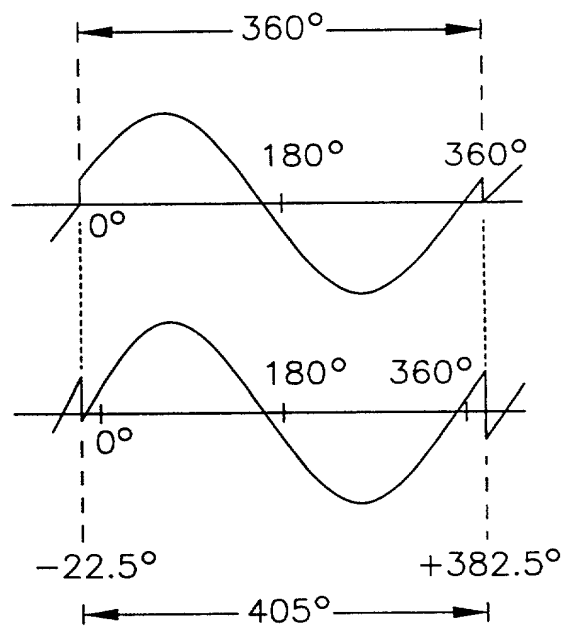


FIG. 53

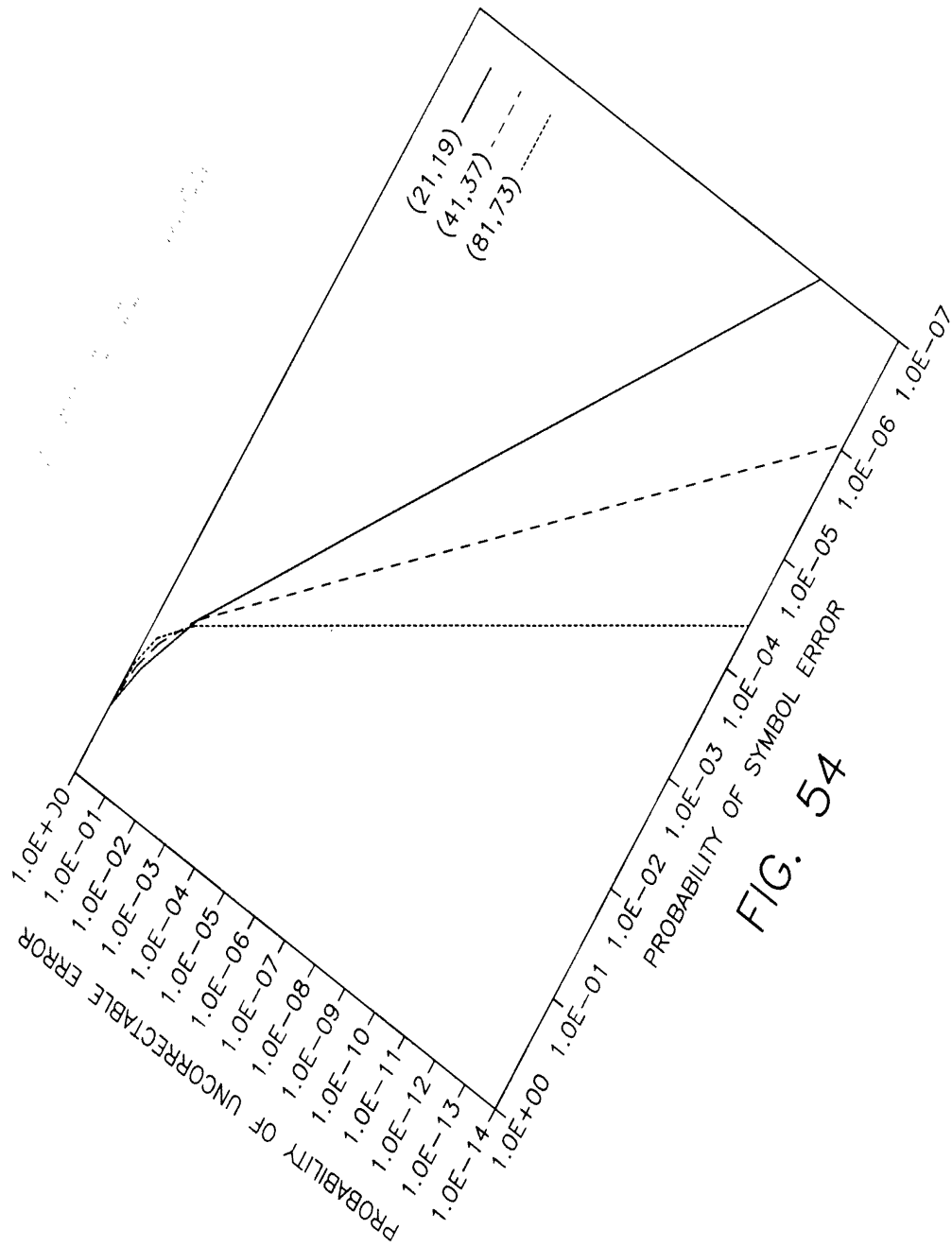


FIG. 54

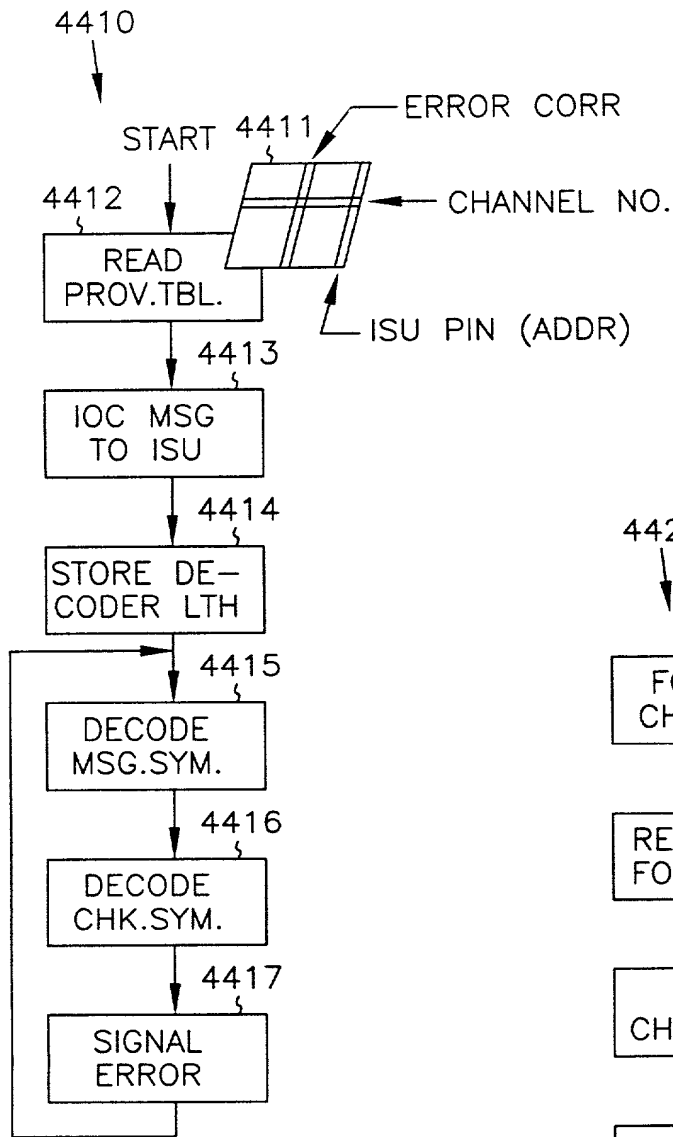


FIG. 55

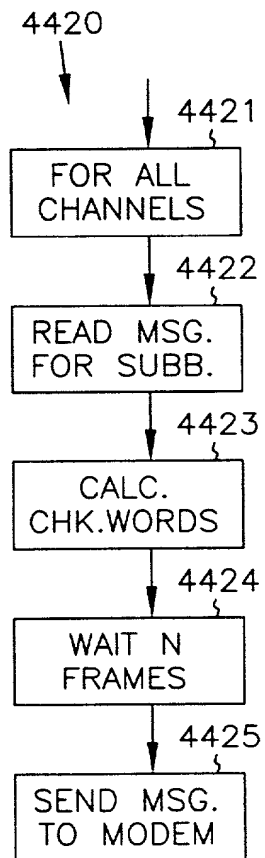


FIG. 56

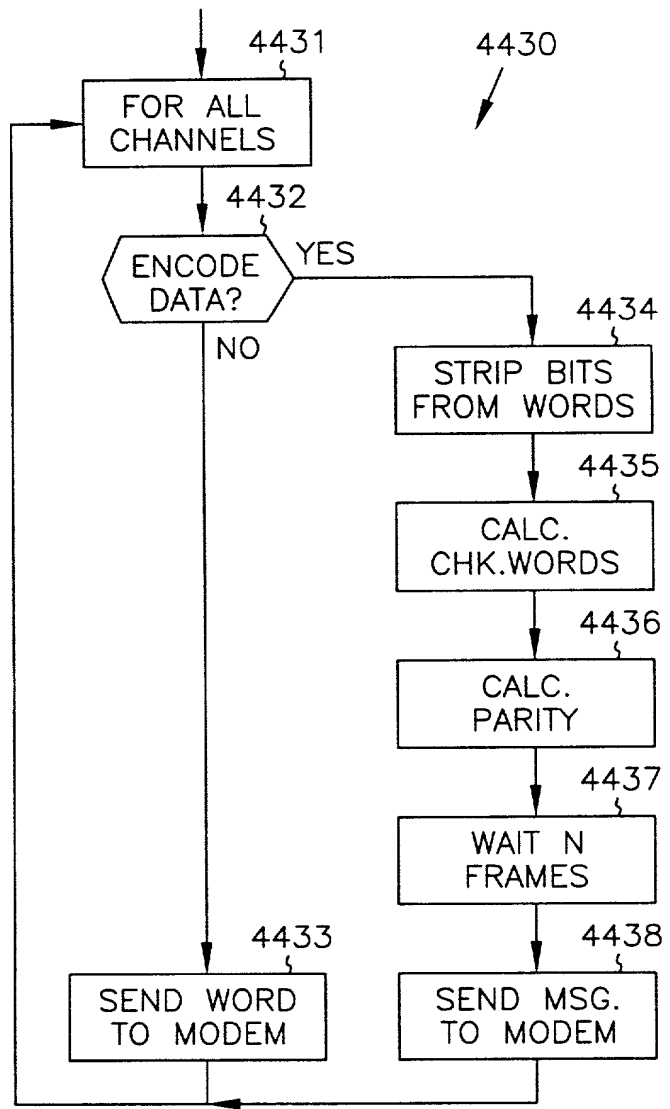


FIG. 57

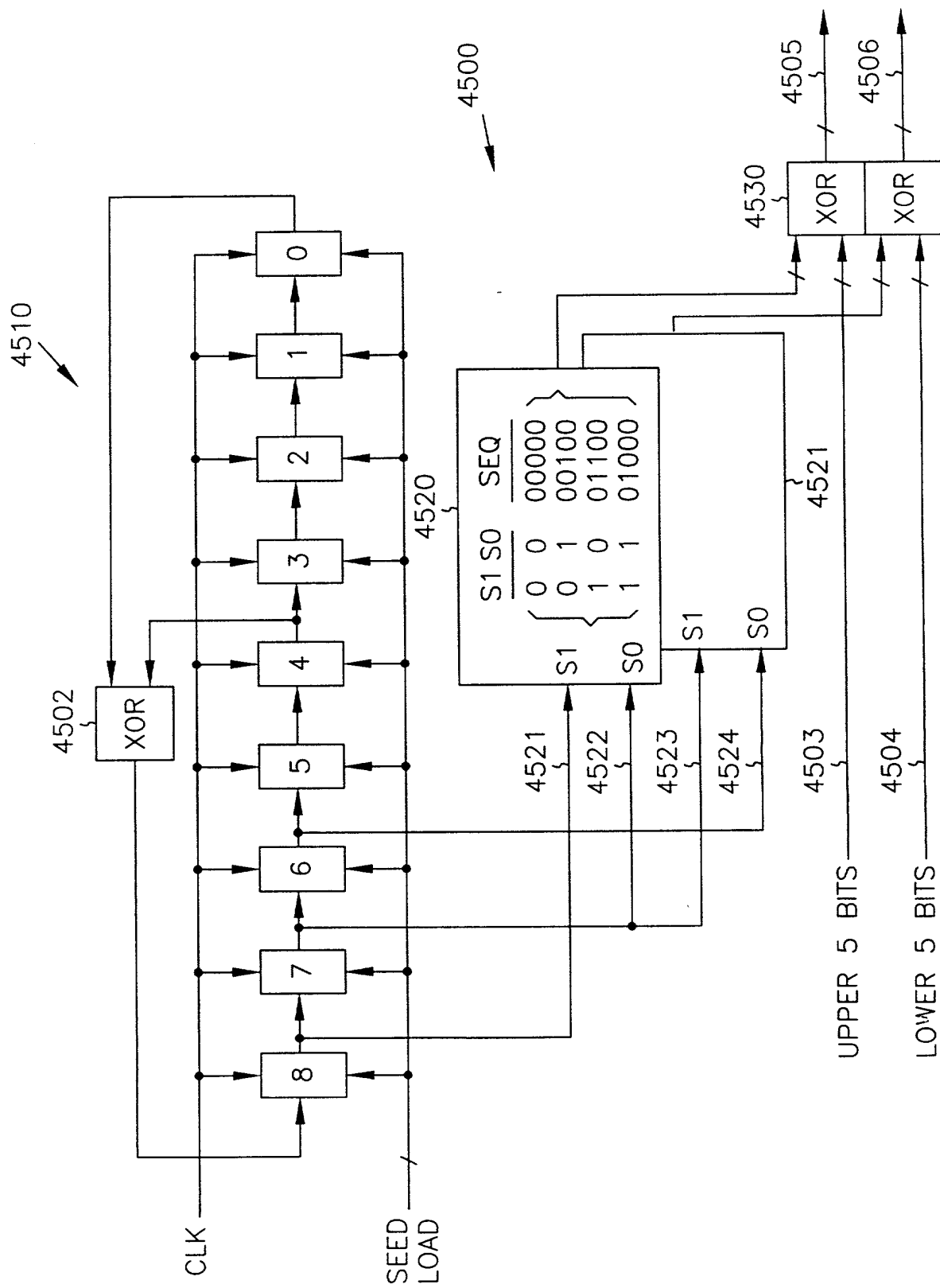


FIG. 58

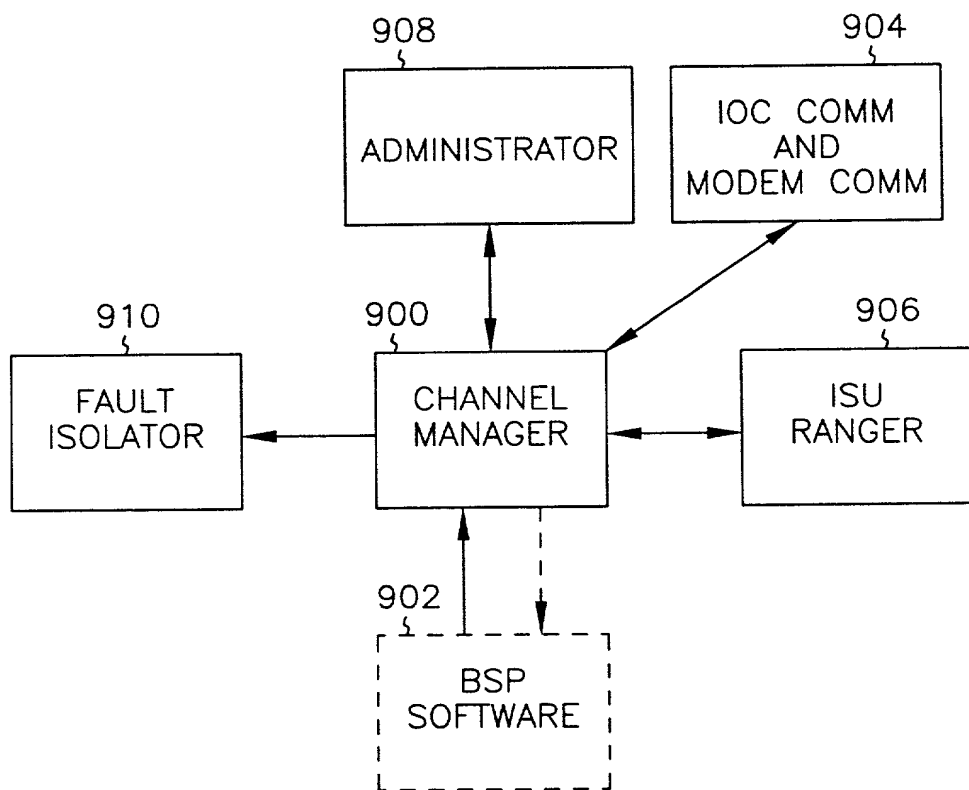


FIG. 59

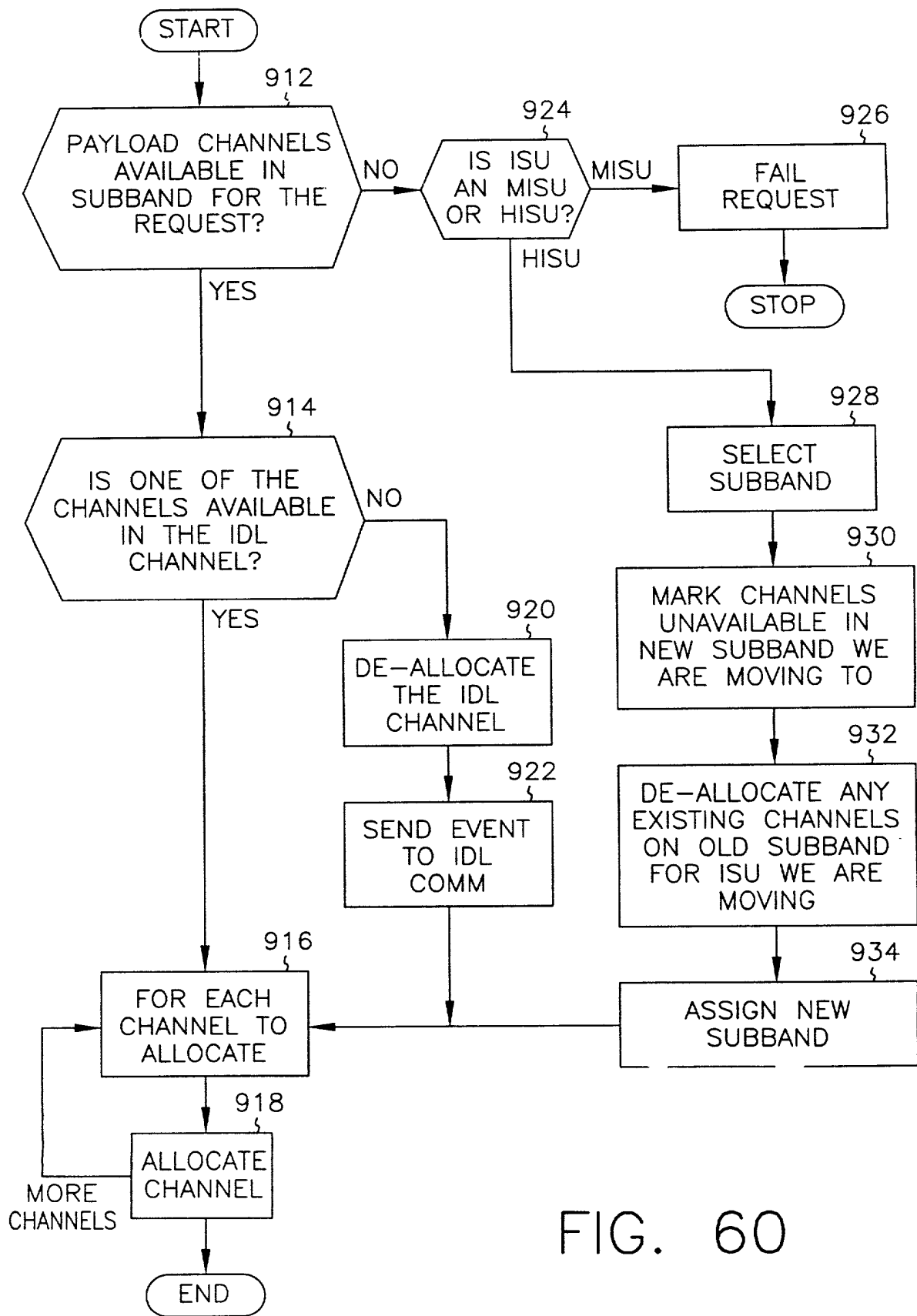


FIG. 60

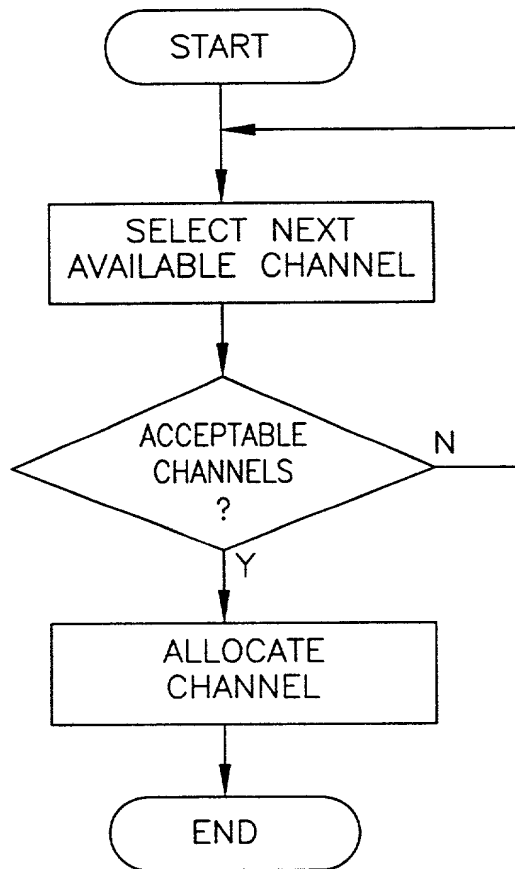


FIG. 61

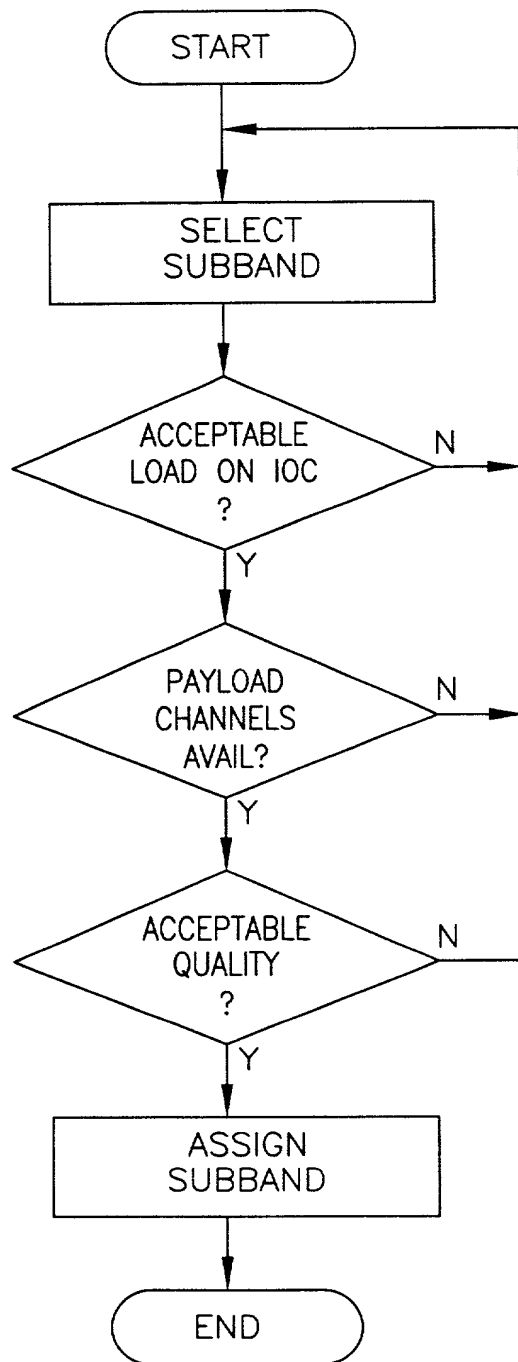


FIG. 62

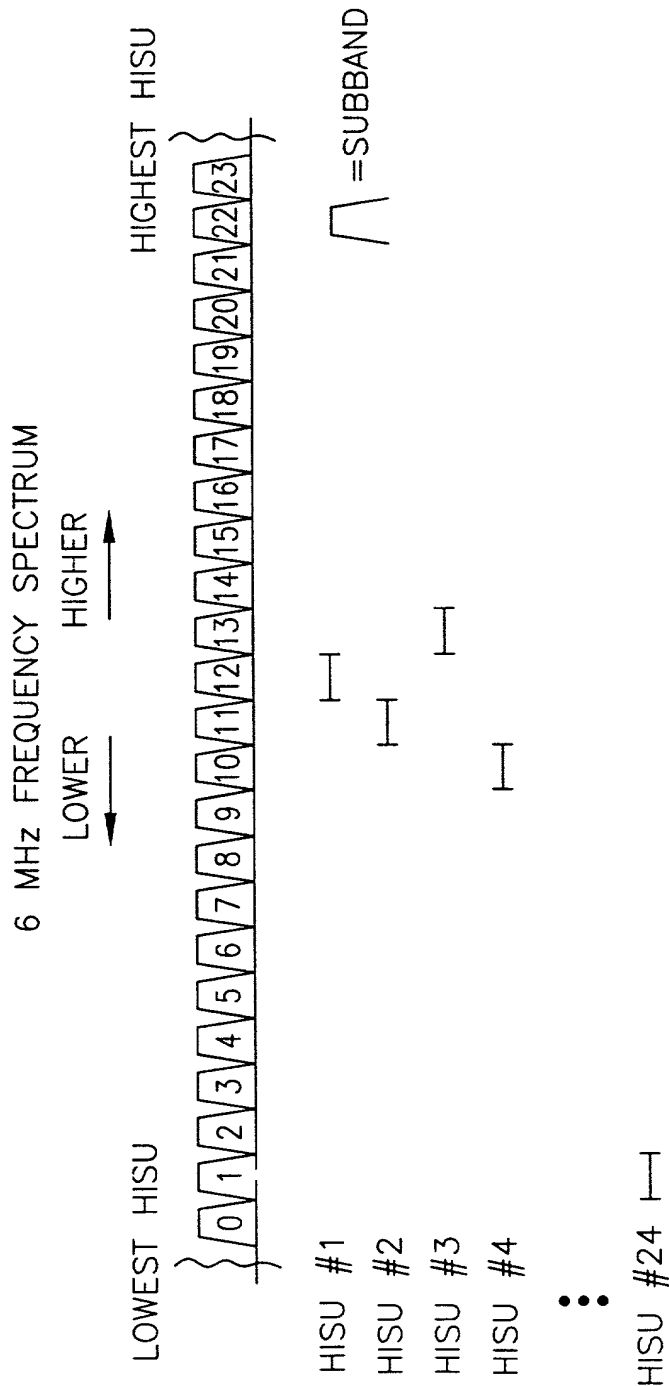


FIG. 63

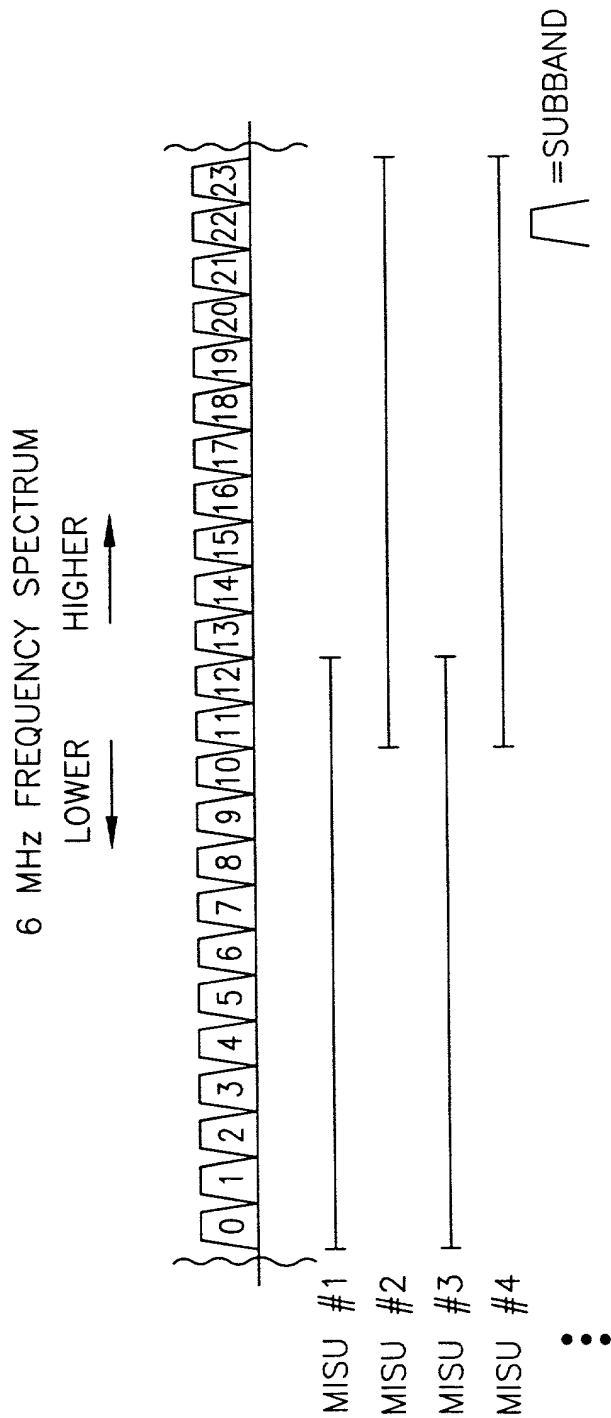


FIG. 64

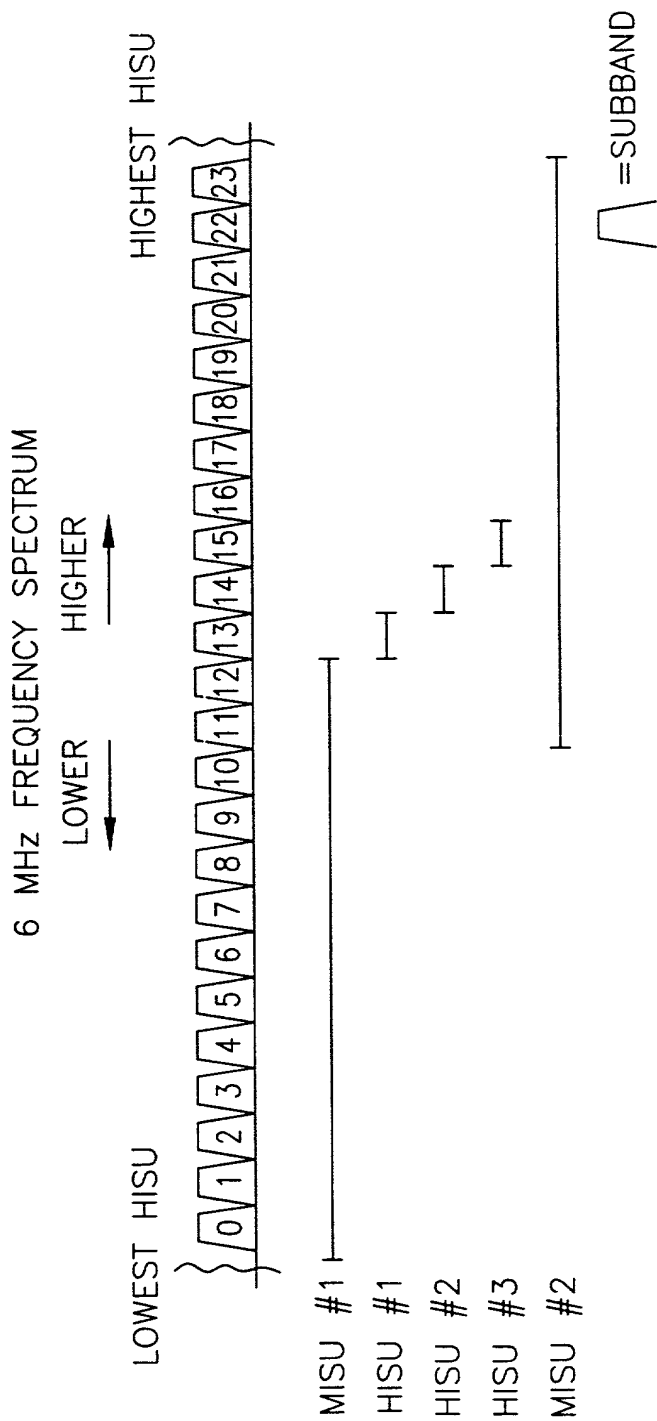


FIG. 65

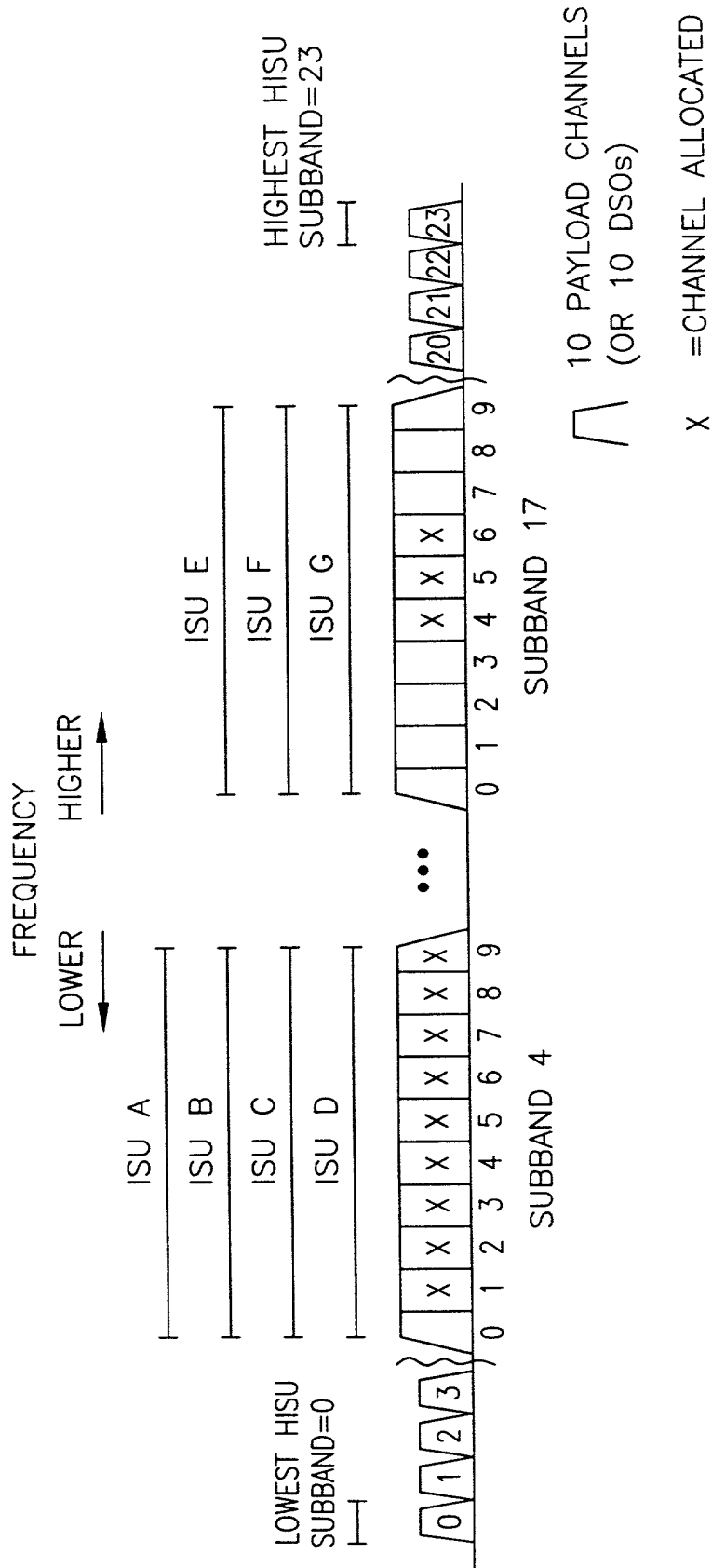


FIG. 66

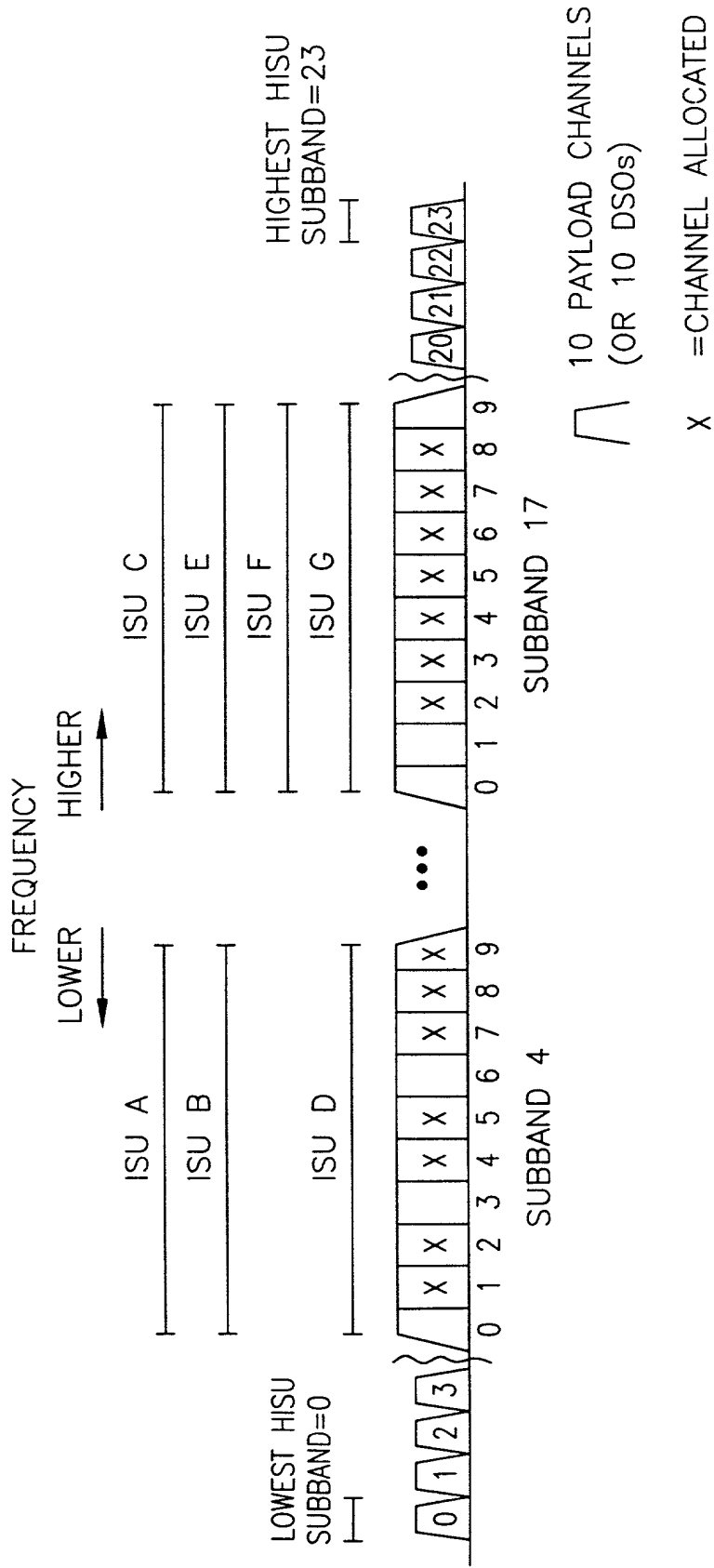


FIG. 67

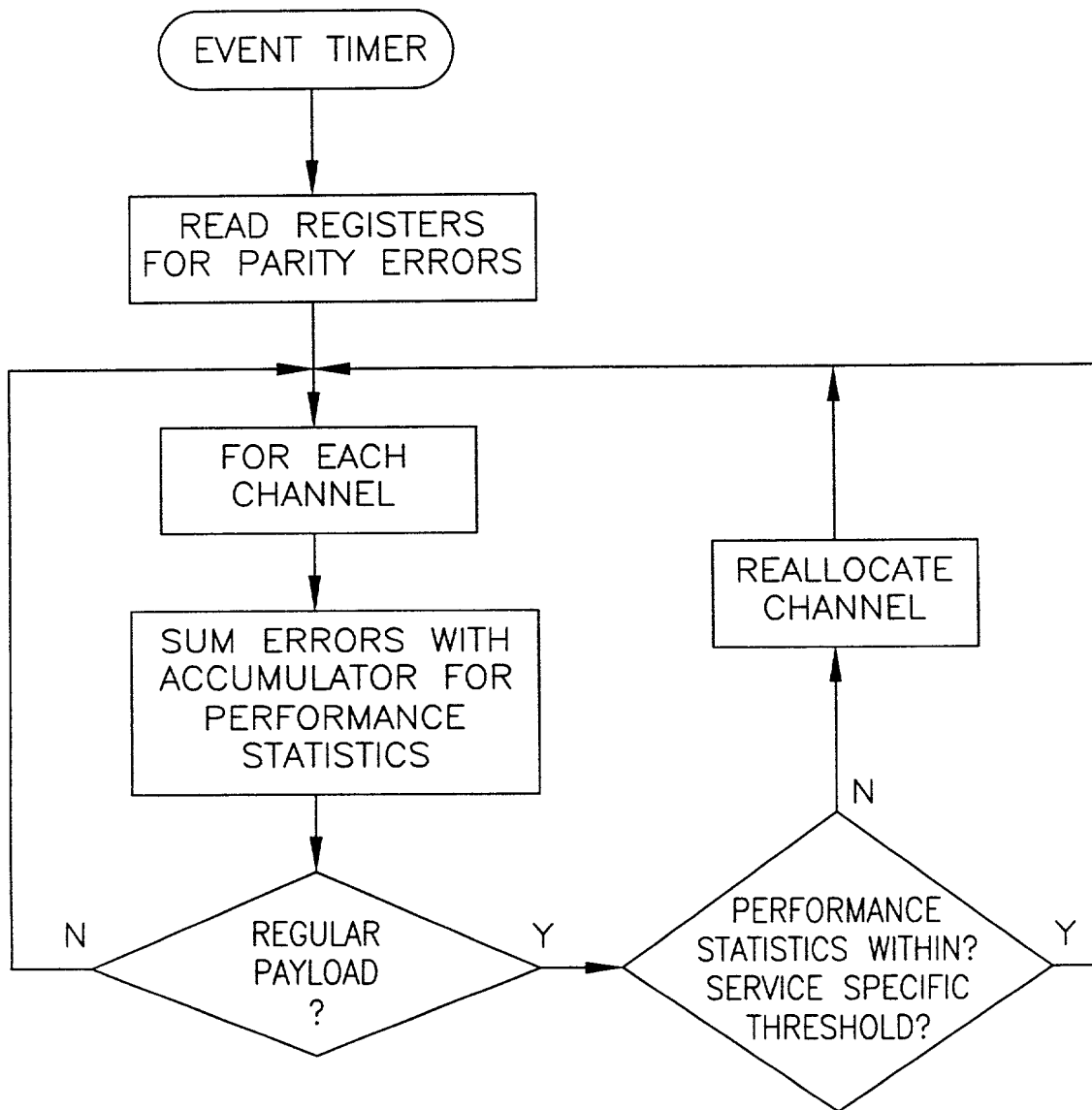


FIG. 68

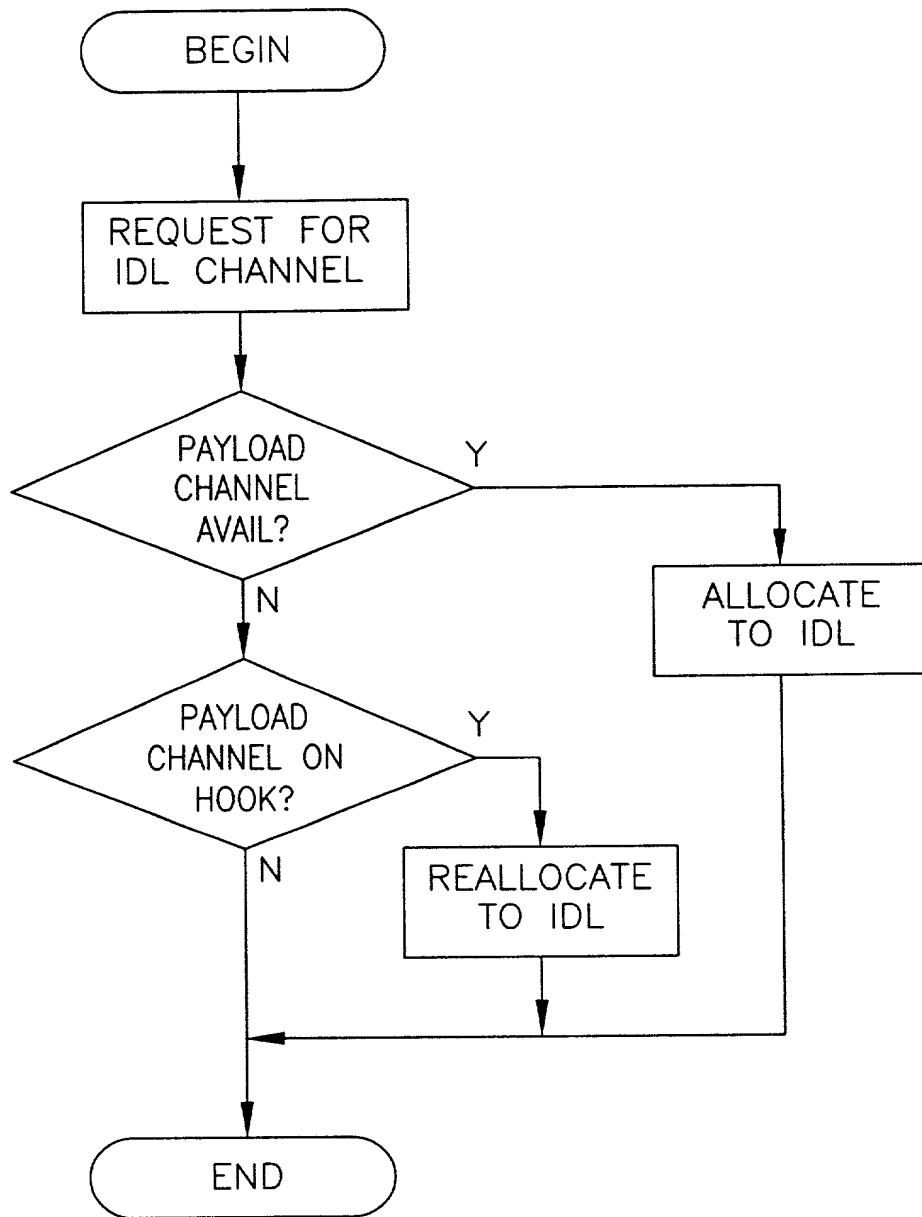


FIG. 69

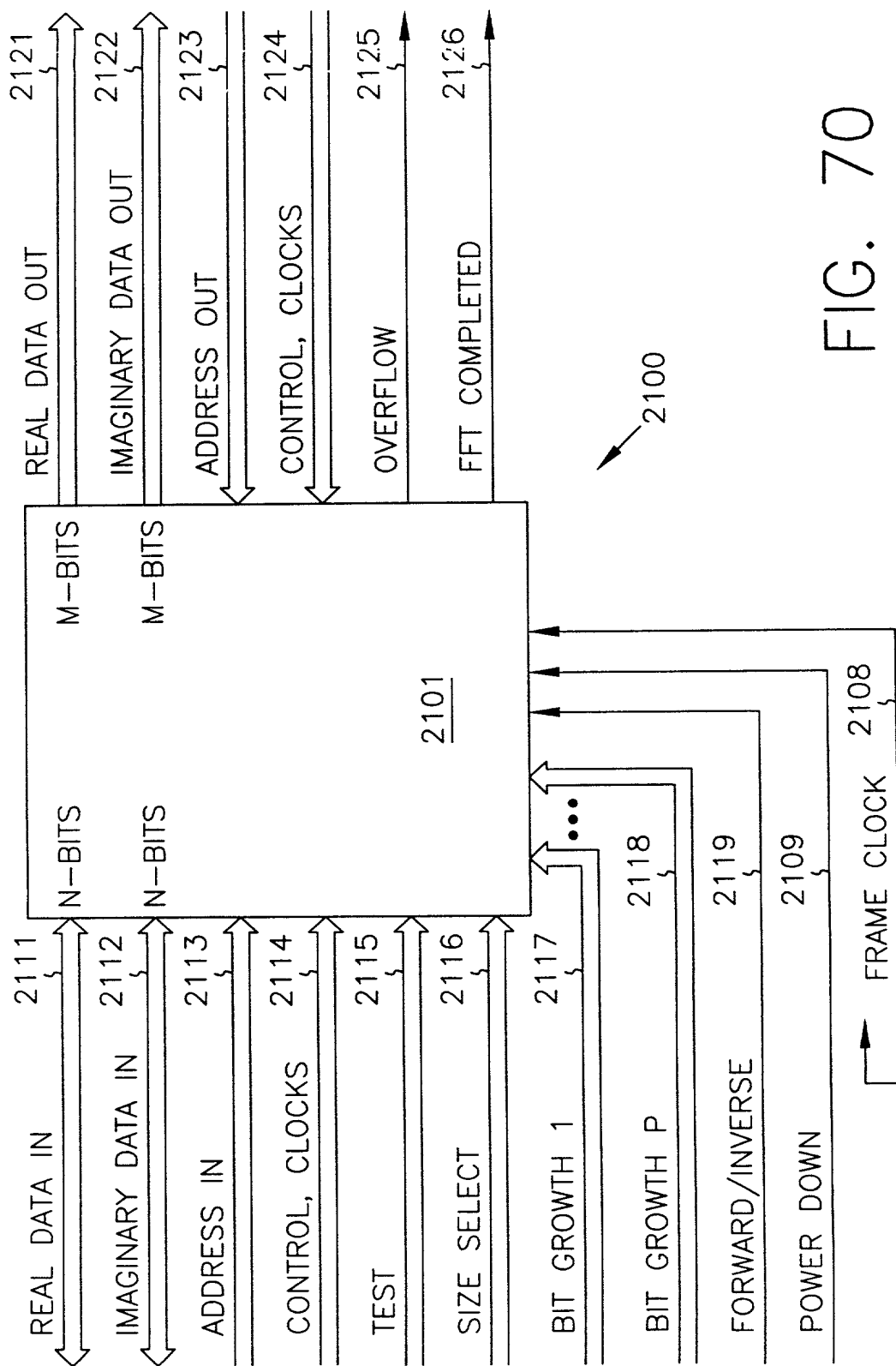


FIG. 70

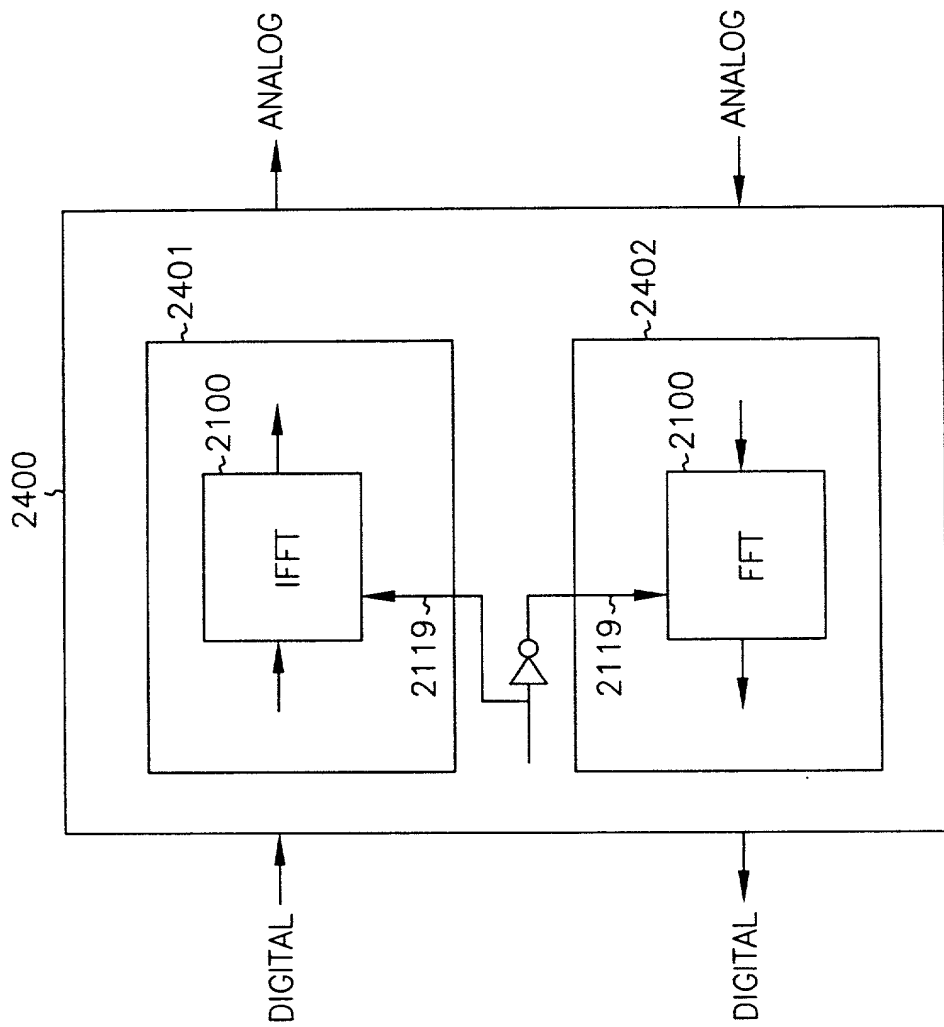


FIG. 71

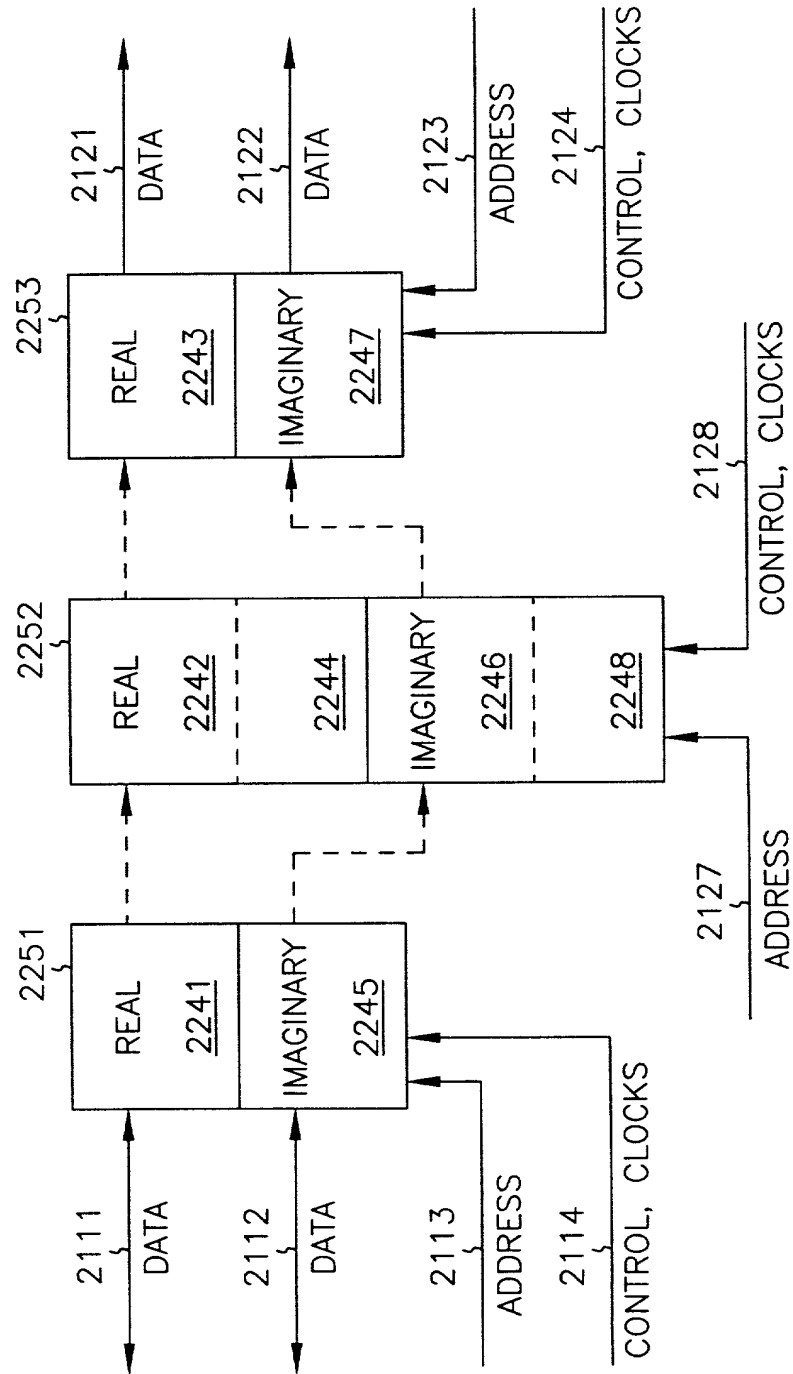


FIG. 72

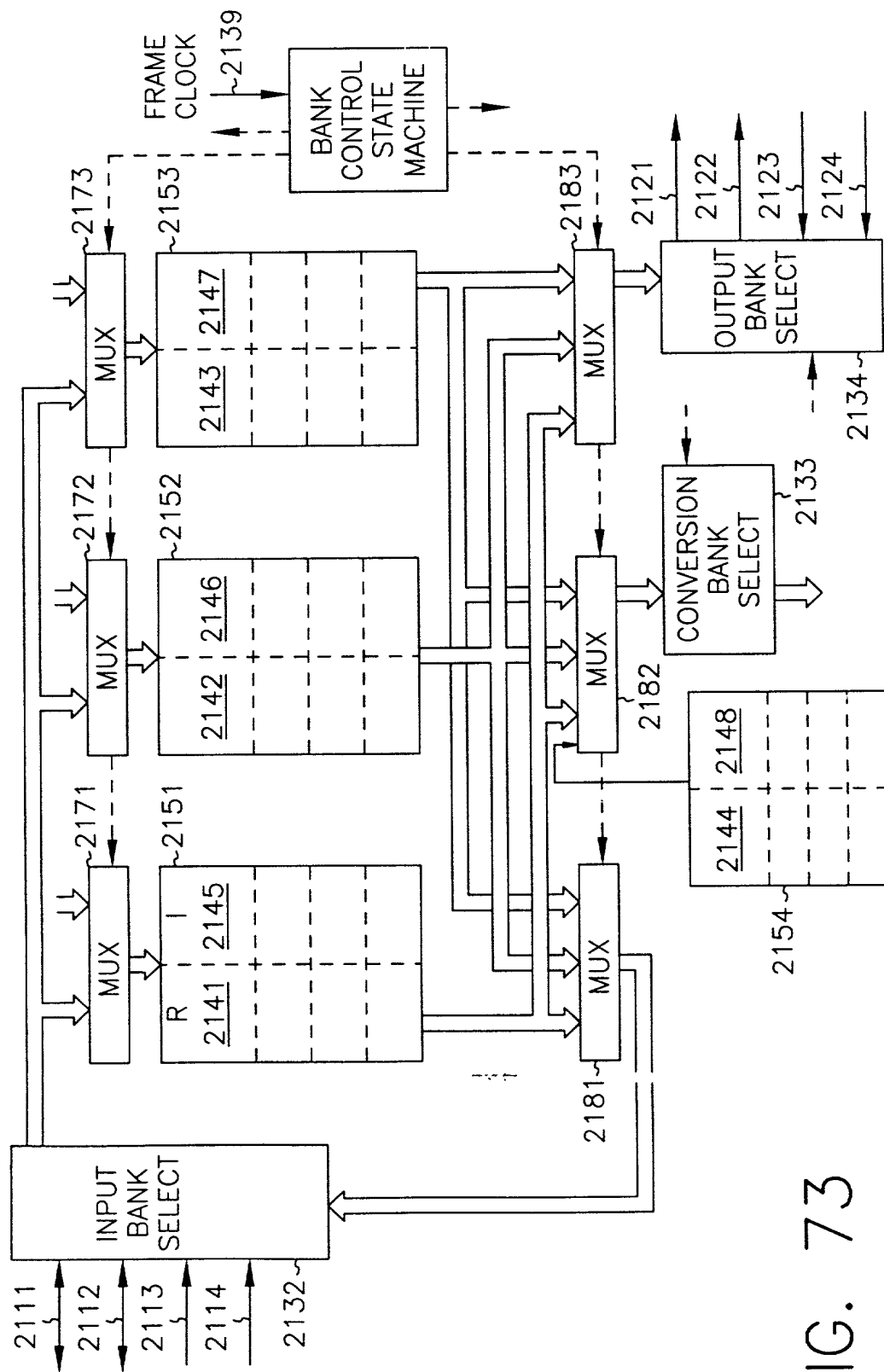
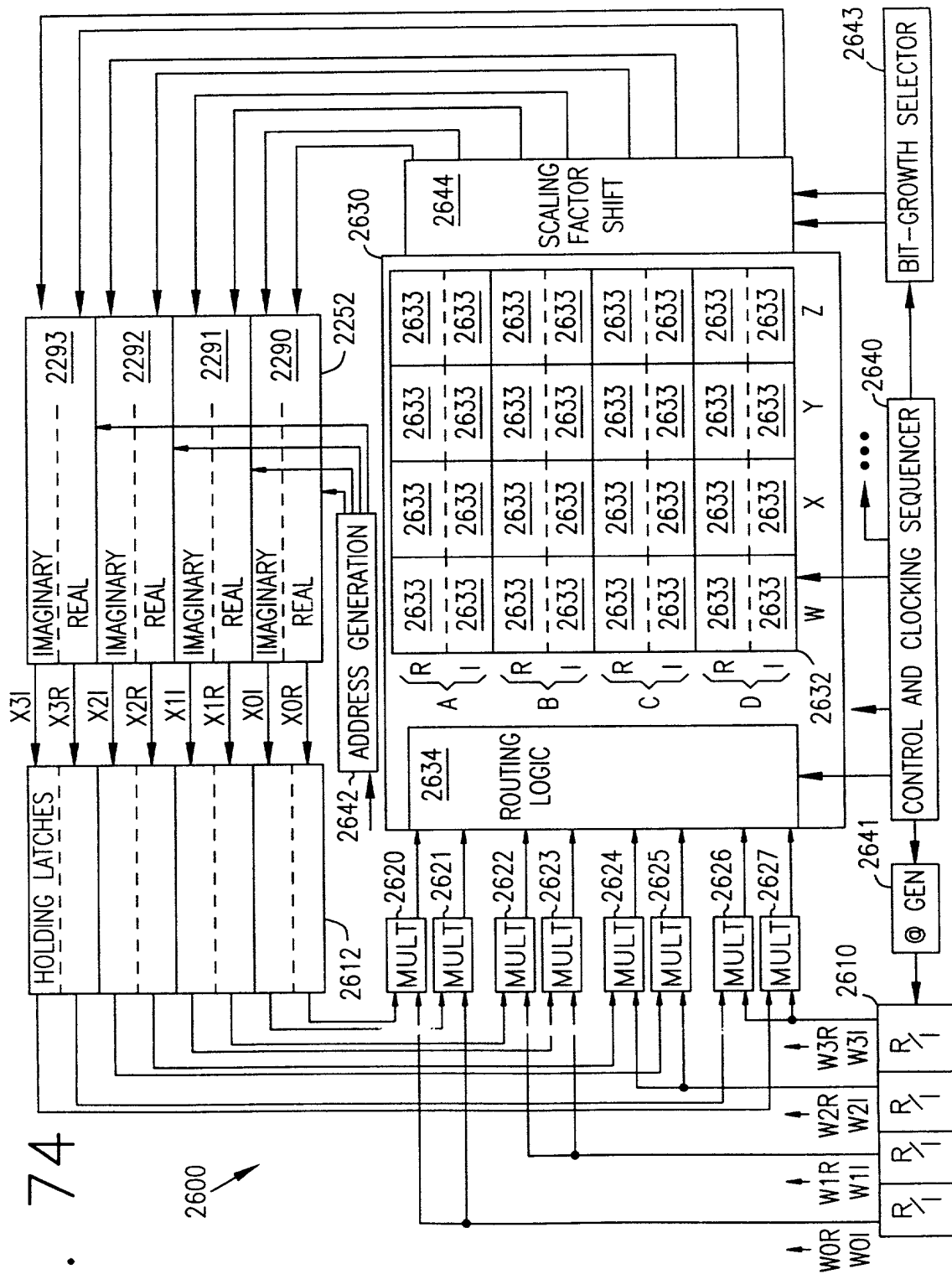


FIG. 73



THIS TABLE SHOWS THE ORDER OF CALCULATION FOR A TRANSPOSED BUTTERFLY:

CO

AWR=WR AWI=WI	AXR=XR AXI=XI	AYR=YR AYI=YI	AZR=ZR AZI=ZI
BWR=WR BWI=WI	BXR=XR BXI=XI	BYR=YR BYI=YI	BZR=ZR BZI=ZI
CWR=WR CWI=WI	CXR=XR CXI=XI	CYR=YR CYI=YI	CZR=ZR CZI=ZI
DWR=WR DWI=WI	DXR=XR DXI=XI	DYR=YR DYI=YI	DZR=ZR DZI=ZI

FIG. 75

CI

AWR=AWR - WI AWI=AWI + WR	AXR=AXR - XI AXI=AXI + XR	AYR=AYR - YI AYI=AYI + YR	AZR=AZR - ZI AZI=AZI + ZR
BWR=BWR - WI BWI=BWI + WR	BXR=BXR - XI BXI=BXI + XR	BYR=BYR - YI BYI=BYI + YR	BZR=BZR - ZI BZI=BZI + ZR
CWR=CWR - WI CWI=CWI + WR	CXR=CXR - XI CXI=CXI + XR	CYR=CYR - YI CYI=CYI + YR	CZR=CZR - ZI CZI=CZI + ZR
DWR=DWR - WI DWI=DWI + WR	DXR=DXR - XI DXI=DXI + XR	DYR=DYR - YI DYI=DYI + YR	DZR=DZR - ZI DZI=DZI + ZR

FIG. 76

C2

~2632

AWR=AWR +WR AWI=AWI +WI	AXR=AXR +XI AXI=AXI -XR	AYR=AYR -YR AYI=AYI -YI	AZR=AZR -ZI AZI=AZI +ZR
BWR=BWR +WR BWI=BWI +WI	BXR=BXR +XI BXI=BXI -XR	BYR=BYR -YR BYI=BYI -YI	BZR=BZR -ZI BZI=BZI +ZR
CWR=CWR +WR CWI=CWI +WI	CXR=CXR +XI CXI=CXI -XR	CYR=CYR -YR CYI=CYI -YI	CZR=CZR -ZI CZI=CZI +ZR
DWR=DWR +WR DWI=DWI +WI	DXR=DXR +XI DXI=DXI -XR	DYR=DYR -YR DYI=DYI -YI	DZR=DZR -ZI DZI=DZI +ZR

2800

FIG. 77

C3

~2632

AWR=AWR -WI AWI=AWI +WR	AXR=AXR +XR AXI=AXI +XI	AYR=AYR +YI AYI=AYI -YR	AZR=AZR -ZR AZI=AZI -ZI
BWR=BWR -WI BWI=BWI +WR	BXR=BXR +XR BXI=BXI +XI	BYR=BYR +YI BYI=BYI -YR	BZR=BZR -ZR BZI=BZI -ZI
CWR=CWR -WI CWI=CWI +WR	CXR=CXR +XR CXI=CXI +XI	CYR=CYR +YI CYI=CYI -YR	CZR=CZR -ZR CZI=CZI -ZI
DWR=DWR -WI DWI=DWI +WR	DXR=DXR +XR DXI=DXI +XI	DYR=DYR +YI DYI=DYI -YR	DZR=DZR -ZR DZI=DZI -ZI

2800

FIG. 78

C4

AWR=AWR +WR AWI=AWI +WI	AXR=AXR --XR AXI=AXI --XI	AYR=AYR +YR AYI=AYI +YI	AZR=AZR -ZR AZI=AZI -ZI
BWR=BWR +WR BWI=BWI +WI	BXR=BXR --XR BXI=BXI --XI	BYR=BYR +YR BYI=BYI +YI	BZR=BZR -ZR BZI=BZI -ZI
CWR=CWR +WR CWI=CWI +WI	CXR=CXR --XR CXI=CXI --XI	CYR=CYR +YR CYI=CYI +YI	CZR=CZR -ZR CZI=CZI -ZI
DWR=DWR +WR DWI=DWI +WI	DXR=DXR --XR DXI=DXI --XI	DYR=DYR +YR DYI=DYI +YI	DZR=DZR -ZR DZI=DZI -ZI

2800

FIG. 79

C5

AWR=AWR --WI AWI=AWI +WR	AXR=AXR +XI AXI=AXI --XR	AYR=AYR --YI AYI=AYI +YR	AZR=AZR +ZI AZI=AZI -ZR
BWR=BWR --WI BWI=BWI +WR	BXR=BXR +XI BXI=BXI --XR	BYR=BYR --YI BYI=BYI +YR	BZR=BZR +ZI BZI=BZI -ZR
CWR=CWR --WI CWI=CWI +WR	CXR=CXR +XI CXI=CXI --XR	CYR=CYR --YI CYI=CYI +YR	CZR=CZR +ZI CZI=CZI -ZR
DWR=DWR --WI DWI=DWI +WR	DXR=DXR +XI DXI=DXI --XR	DYR=DYR --YI DYI=DYI +YR	DZR=DZR +ZI DZI=DZI -ZR

2800

FIG. 80

C6

AWR=AWR +WR AWI=AWI +WI	AXR=AXR -XI AXI=AXI +XR	AYR=AYR -YR AYI=AYI -YI	AZR=AZR +ZI AZI=AZI -ZR
BWR=BWR +WR BWI=BWI +WI	BXR=BXR -XI BXI=BXI +XR	BYR=BYR -YR BYI=BYI -YI	BZR=BZR +ZI BZI=BZI -ZR
CWR=CWR +WR CWI=CWI +WI	CXR=CXR -XI CXI=CXI +XR	CYR=CYR -YR CYI=CYI -YI	CZR=CZR +ZI CZI=CZI -ZR
DWR=DWR +WR DWI=DWI +WI	DXR=DXR -XI DXI=DXI +XR	DYR=DYR -YR DYI=DYI -YI	DZR=DZR +ZI DZI=DZI -ZR

~2632

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FIG. 81

C7

AWR=AWR -WI AWI=AWI +WR	AXR=AXR -XR AXI=AXI -XI	AYR=AYR +YI AYI=AYI -YR	AZR=AZR -ZR AZI=AZI +ZI
BWR=BWR -WI BWI=BWI +WR	BXR=BXR -XR BXI=BXI -XI	BYR=BYR +YI BYI=BYI -YR	BZR=BZR -ZR BZI=BZI +ZI
CWR=CWR -WI CWI=CWI +WR	CXR=CXR -XR CXI=CXI -XI	CYR=CYR +YI CYI=CYI -YR	CZR=CZR -ZR CZI=CZI +ZI
DWR=DWR -WI DWI=DWI +WR	DXR=DXR -XR DXI=DXI -XI	DYR=DYR +YI DYI=DYI -YR	DZR=DZR -ZR DZI=DZI +ZI

~2632

2800

FIG. 82

THIS TABLE SHOWS THE ORDER OF CALCULATION FOR A TRANSPOSED BUTTERFLY:

2632

2810

AWR = WR+XR+YR+ZR AWI = WI+XI+YI+ZI	AXR = WR-XI-YR+ZI AXI = WI+XR-YI-ZR	AYR = WR-XR+YR-ZR AYI = WI-XI+YI-ZI	AZR = WR+XI-YR-ZI AZI = WI-XR-YI+ZR
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-

FIG. 83

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AWR = AWR-(WI+XI+YI+ZI) AWI = AWI+(WR+XR+YR+ZR)	AXR = AXR-(WI+XR-YI-ZR) AXI = AXI+(WR-XI-YR+ZI)	AYR = AYR-(WI-XI+YI-ZI) AYI = AYI+(WR-XR+YR-ZR)	AZR = AZR-(WI-XR-YI+ZR) AZI = AZI+(WR+XI-YR-ZI)
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-

FIG. 84

C2	-	-	-	-	-	-
	-	-	-	-	-	-
	$BWR = WR + XR + YR + ZR$ $BWI = WI + XI + YI + ZI$	$BXR = WR - XI - YR + ZI$ $BXI = WI + XR - YI - ZR$	$BYR = WR - XR + YR - ZR$ $BYI = WI - XI + YI - ZI$	$BZR = WR + XI - YR - ZI$ $BZI = WI - XR - YI + ZR$	2810	
	-	-	-	-		
	-	-	-	-	2632	
	-	-	-	-		

FIG. 85

C3	-	-	-	-	-	-
	-	-	-	-	-	-
	$BWR = BWR - (WI + XI + YI + ZI)$ $BWI = BWI + (WR + XR + YR + ZR)$	$BXR = BXR - (WI + XR - YI - ZR)$ $BXI = BXI + (WR - XI - YR + ZI)$	$BYR = BYR - (WI - XI + YI - ZI)$ $BYI = BYI + (WR - XR + YR - ZR)$	$BZR = BZR - (WI - XR - YI + ZR)$ $BZI = BZI + (WR + XI - YR - ZI)$	2810	
	-	-	-	-		
	-	-	-	-	2632	
	-	-	-	-		

FIG. 86

C4

2632

2810

-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
CWR = WR+XR+YR+ZR CWI = WI+XI+YI+ZI	CXR = WR-XI-YR+ZI CXI = WI+XR-YI-ZR	CYR = WR-XR+YR-ZR CYI = WI-XI+YI-ZI	CZR = WR+XI-YR-ZI CZI = WI-XR-YI+ZR	
-	-	-	-	-
-	-	-	-	-

FIG. 87

C5

2632

2810

-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
CWR = CWR-(WI+XI+YI+ZI) CWI = CWI+(WR+XR+YR+ZR)	CXR = CXR-(WI+XR-YI-ZR) CXI = CXI+(WR-XI-YR+ZI)	CYR = CYR-(WI-XI+YI-ZI) CYI = CYI+(WR-XR+YR-ZR)	CZR = CZR-(WI-XR-YI+ZR) CZI = CZI+(WR+XI-YR-ZI)	
-	-	-	-	-
-	-	-	-	-

FIG. 88

C6

2632

2810

-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
DWR = WR + XR + YR + ZR DWI = WI + XI + YI + ZI	DXR = WR - XI - YR + ZI DXI = WI + XR - YI - ZR	DYR = WR - XR + YR - ZR DYI = WI - XI + YI - ZI	DZR = WR + XI - YR - ZI DZI = WI - XR - YI + ZR	

FIG. 89

C7

2632

2810

-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
-	-	-	-	-
DWR = DWR - (WI + XI + YI + ZI) DWI = DWI + (WR + XR + YR + ZR)	DXR = DXR - (WI + XR - YI - ZR) DXI = DXI + (WR - XI - YR + ZI)	DYR = DYR - (WI - XI + YI - ZI) DYI = DYI + (WR - XR + YR - ZR)	DZR = DZR - (WI - XR - YI + ZR) DZI = DZI + (WR + XI - YR - ZI)	

FIG. 90

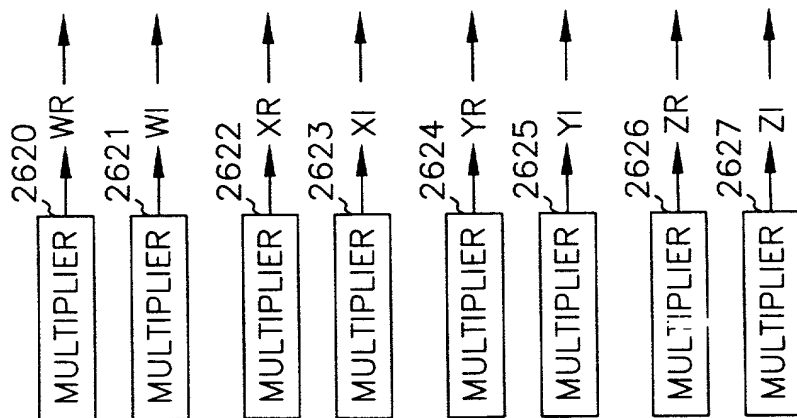
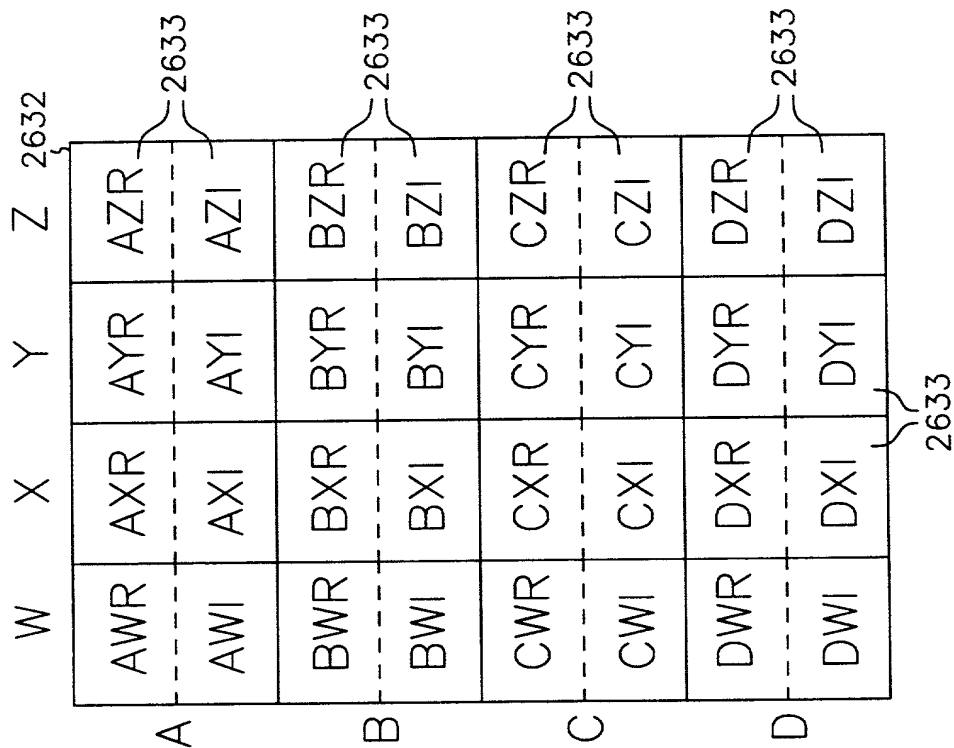


FIG. 91

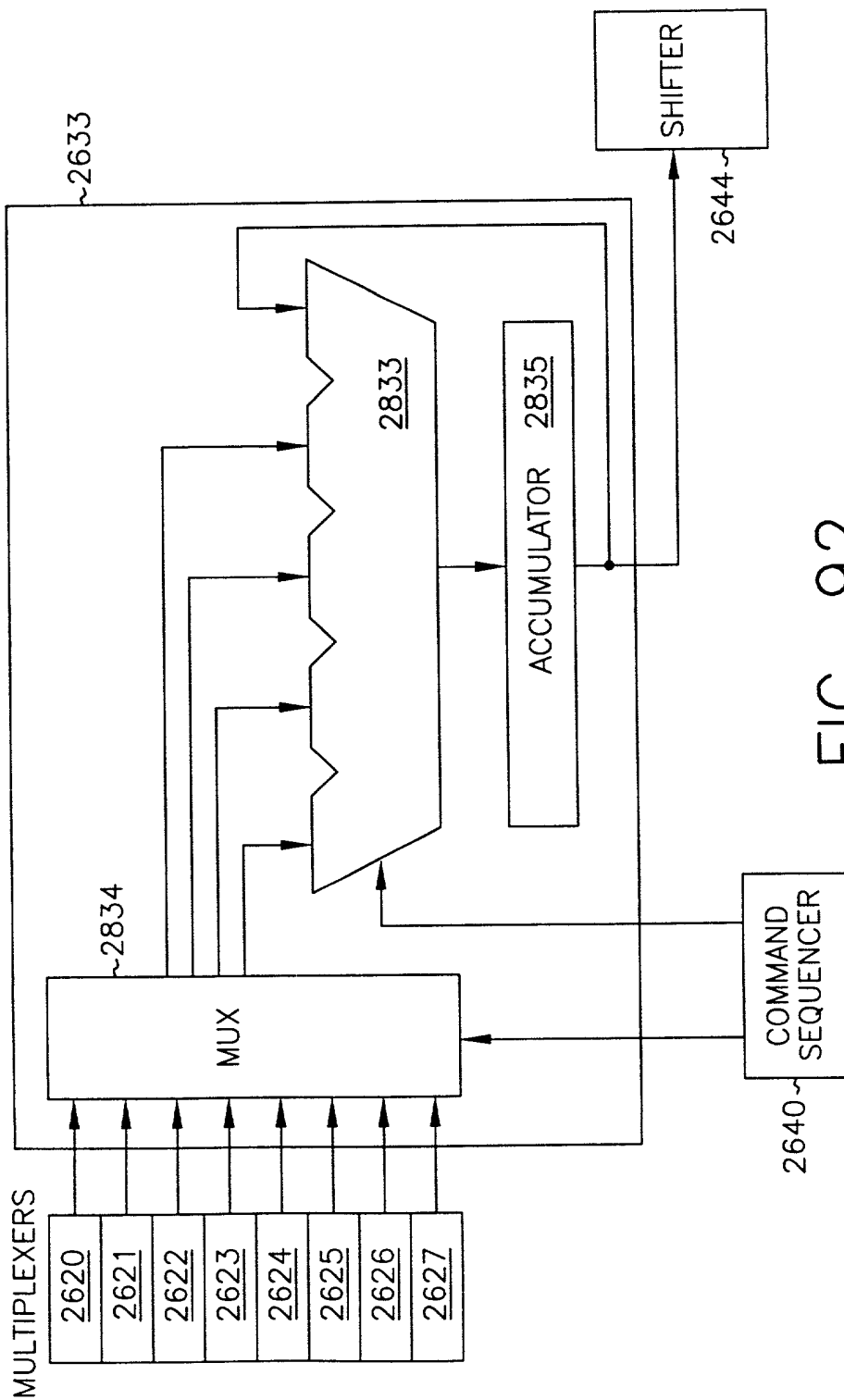


FIG. 92

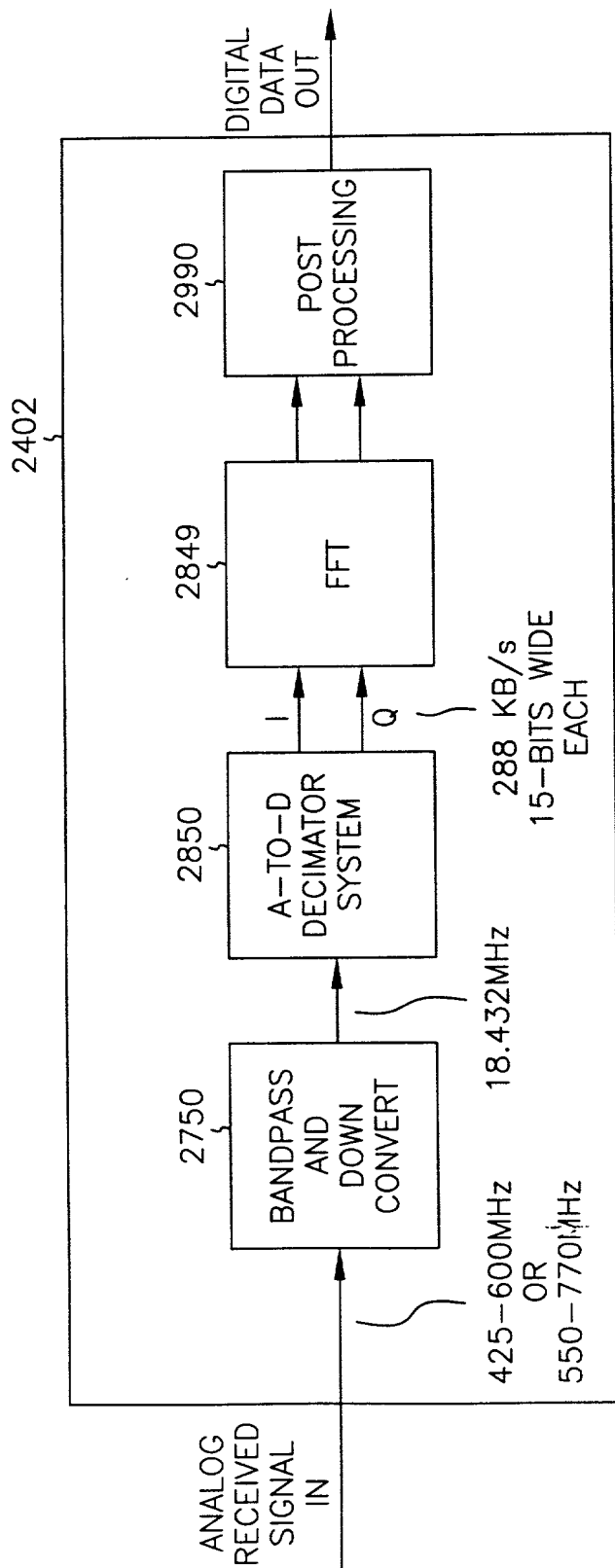


FIG. 93

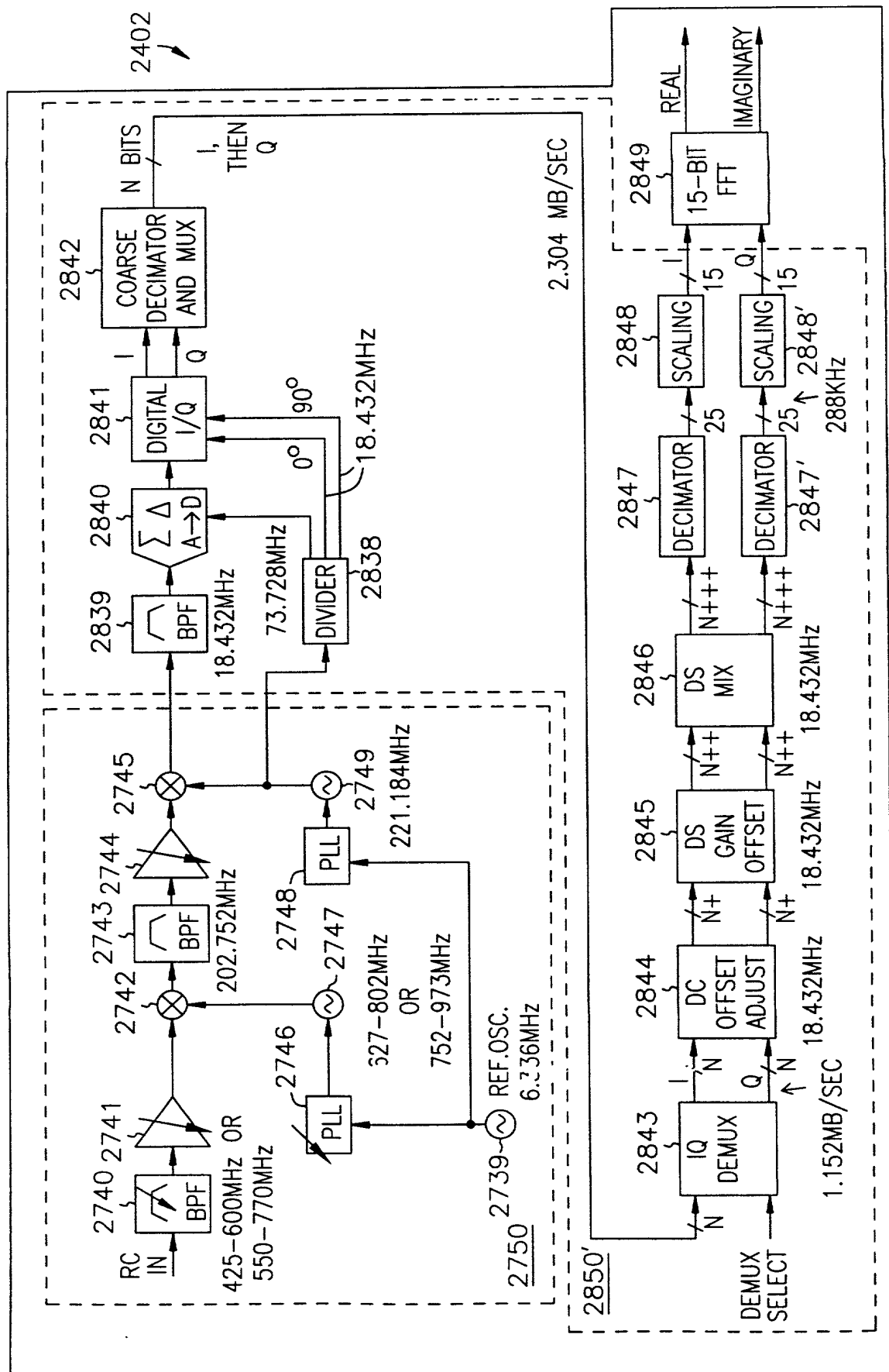


FIG. 94

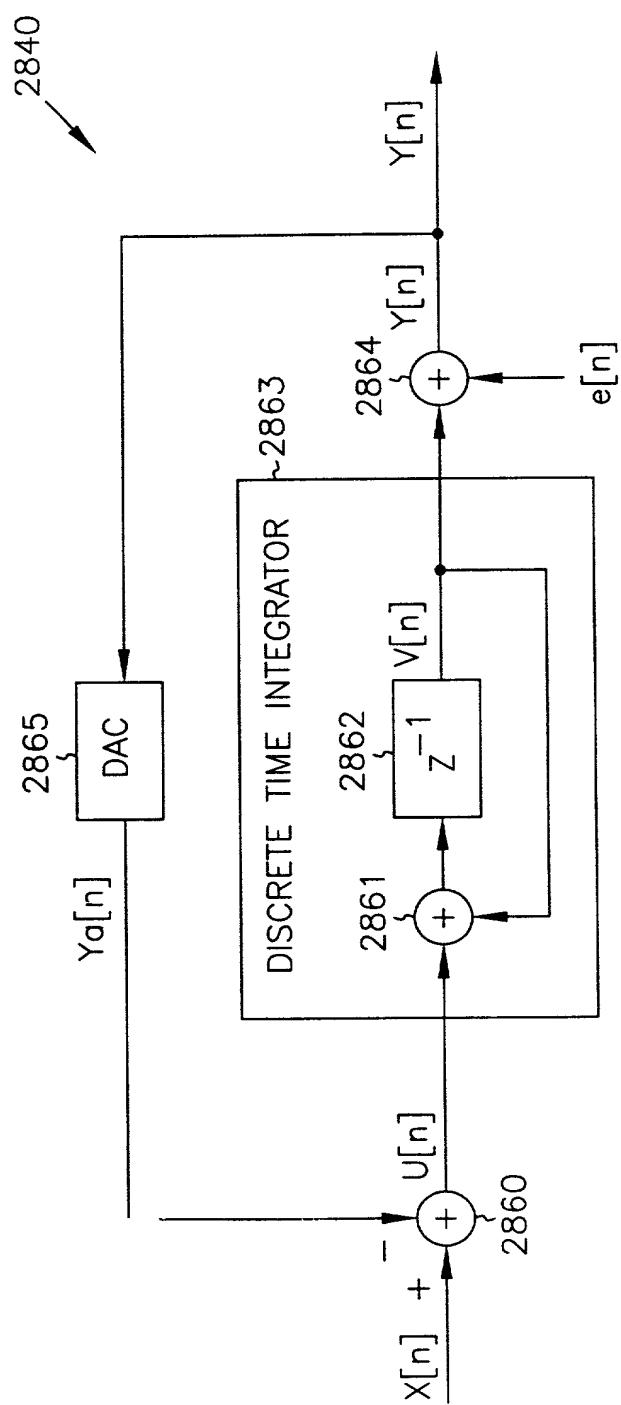


FIG. 95

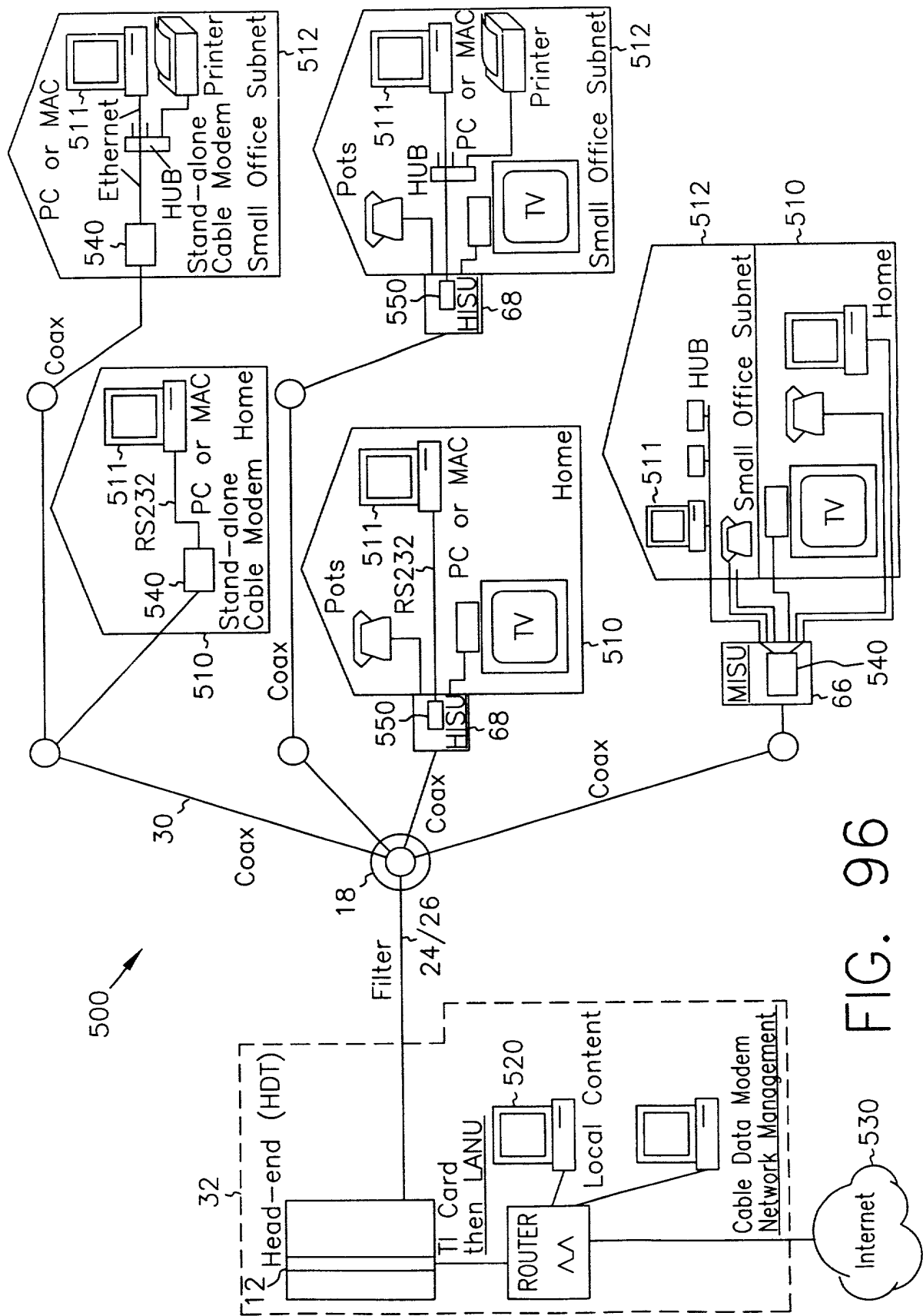


FIG. 96

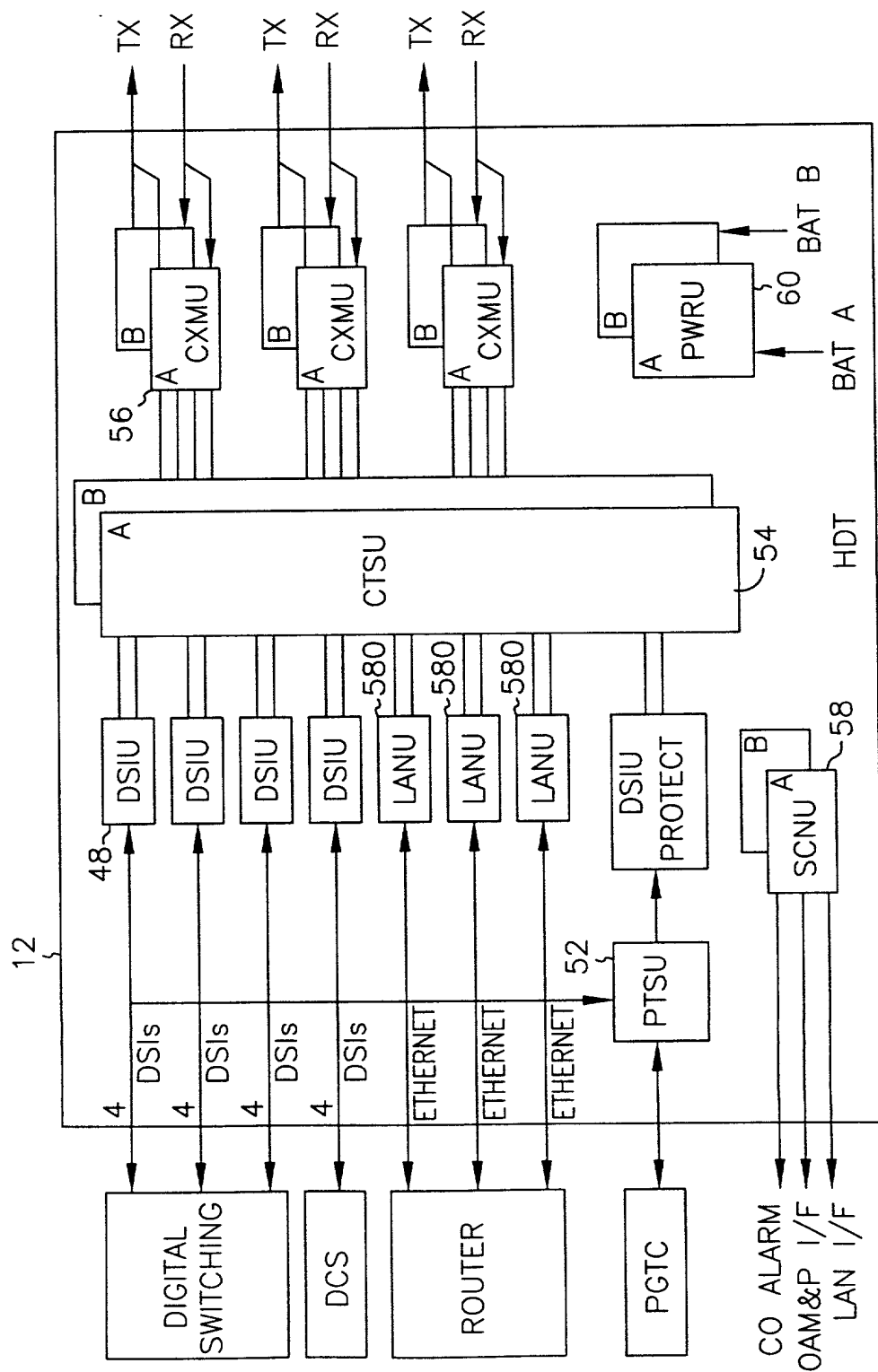


FIG. 97

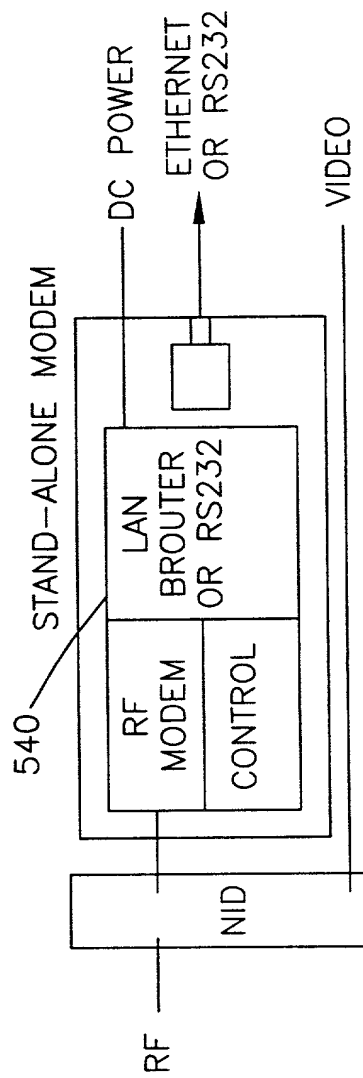
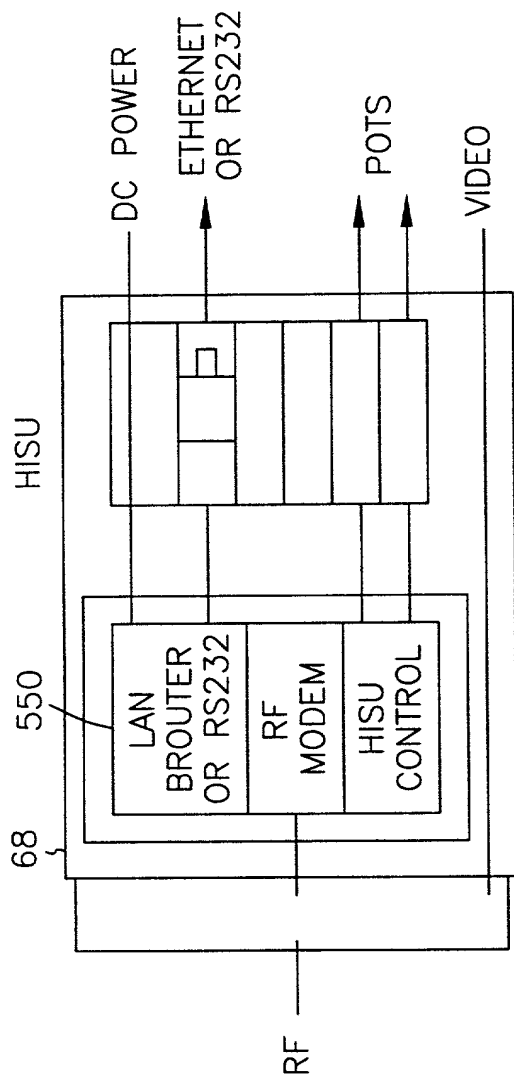


FIG. 98

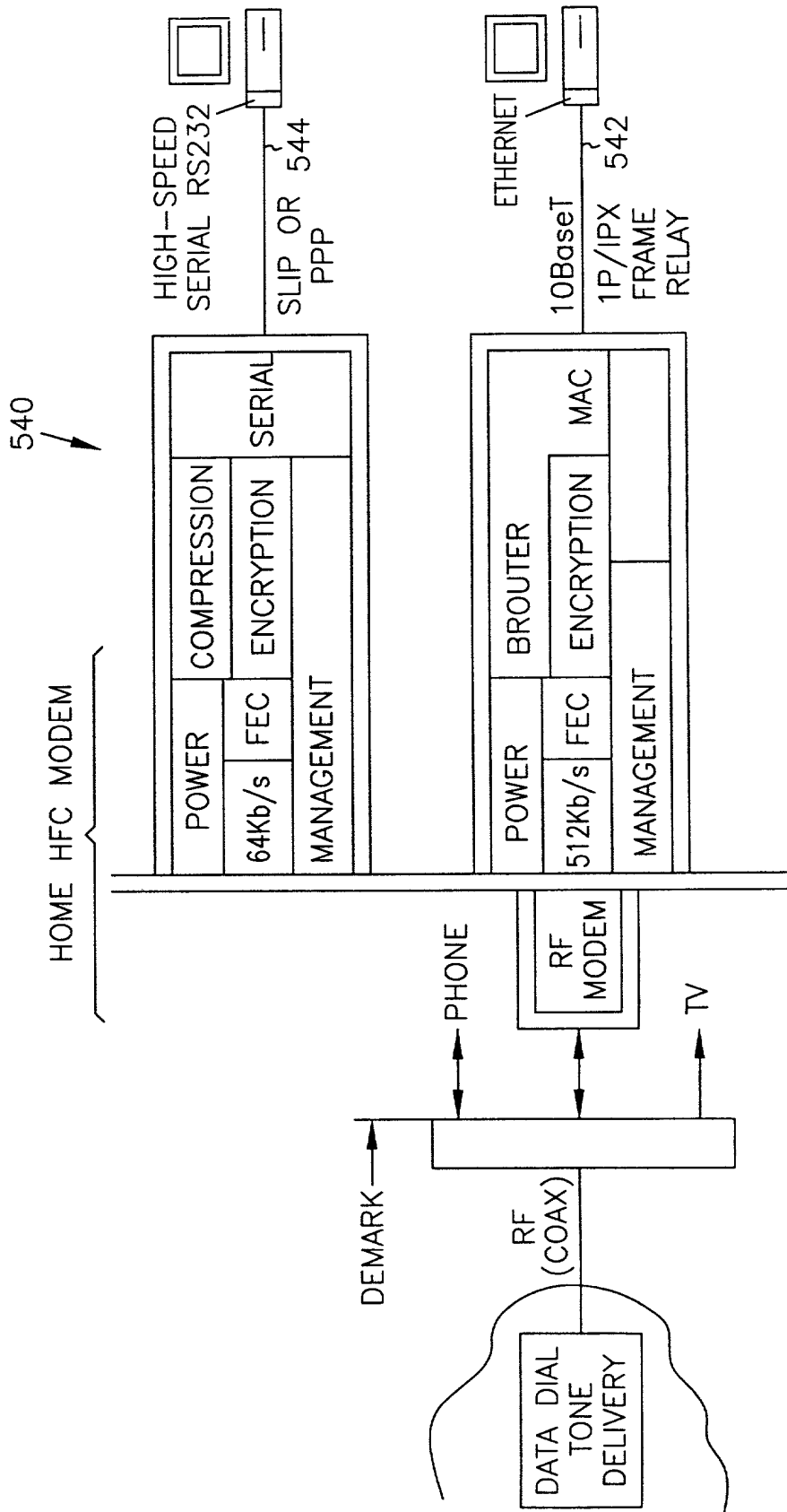


FIG. 99

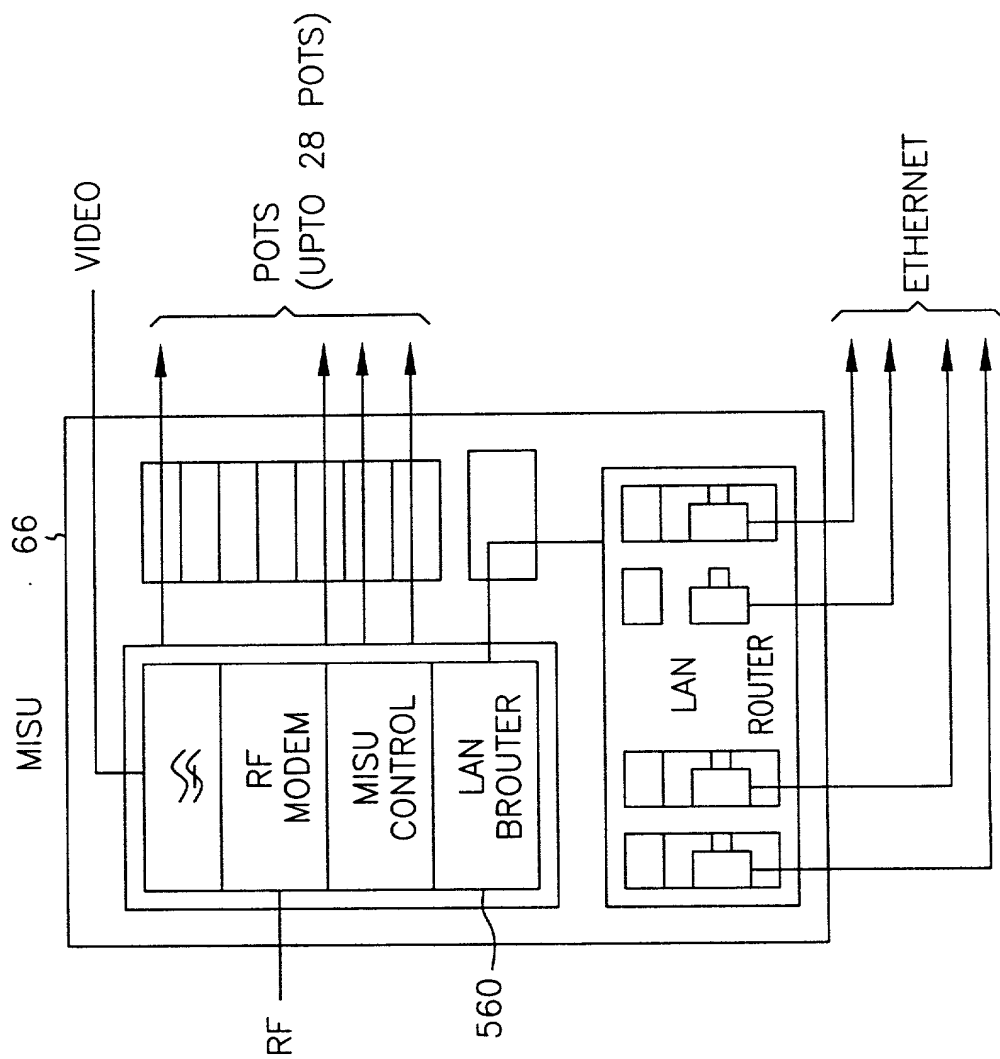


FIG. 100

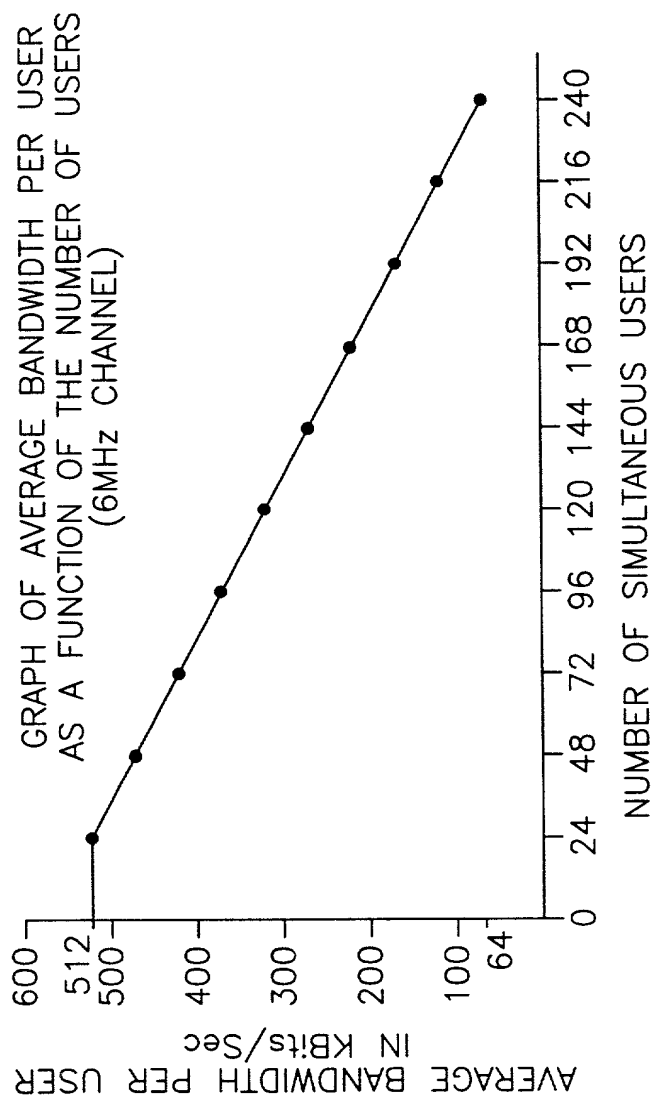


FIG. 101

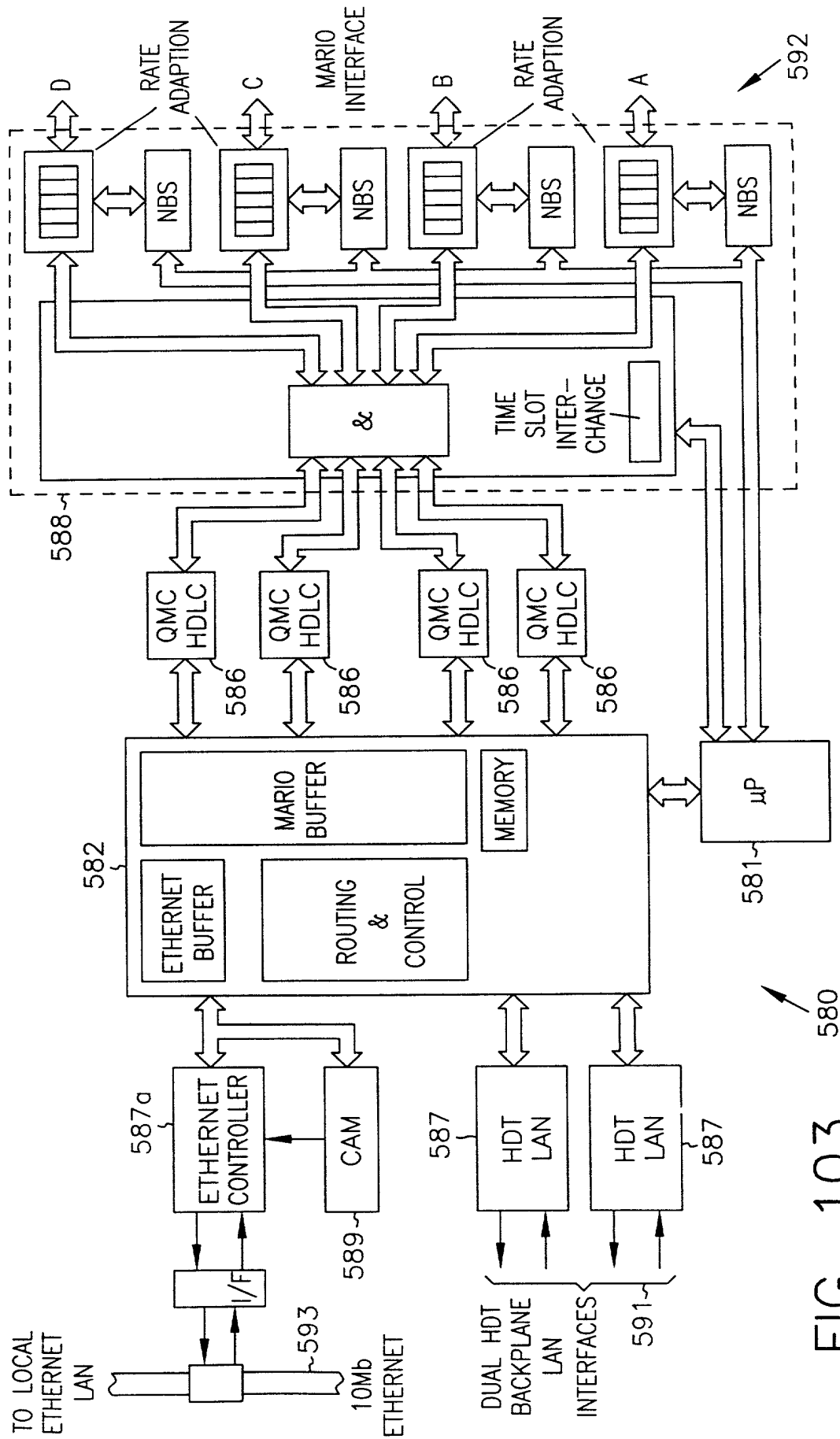


FIG. 103

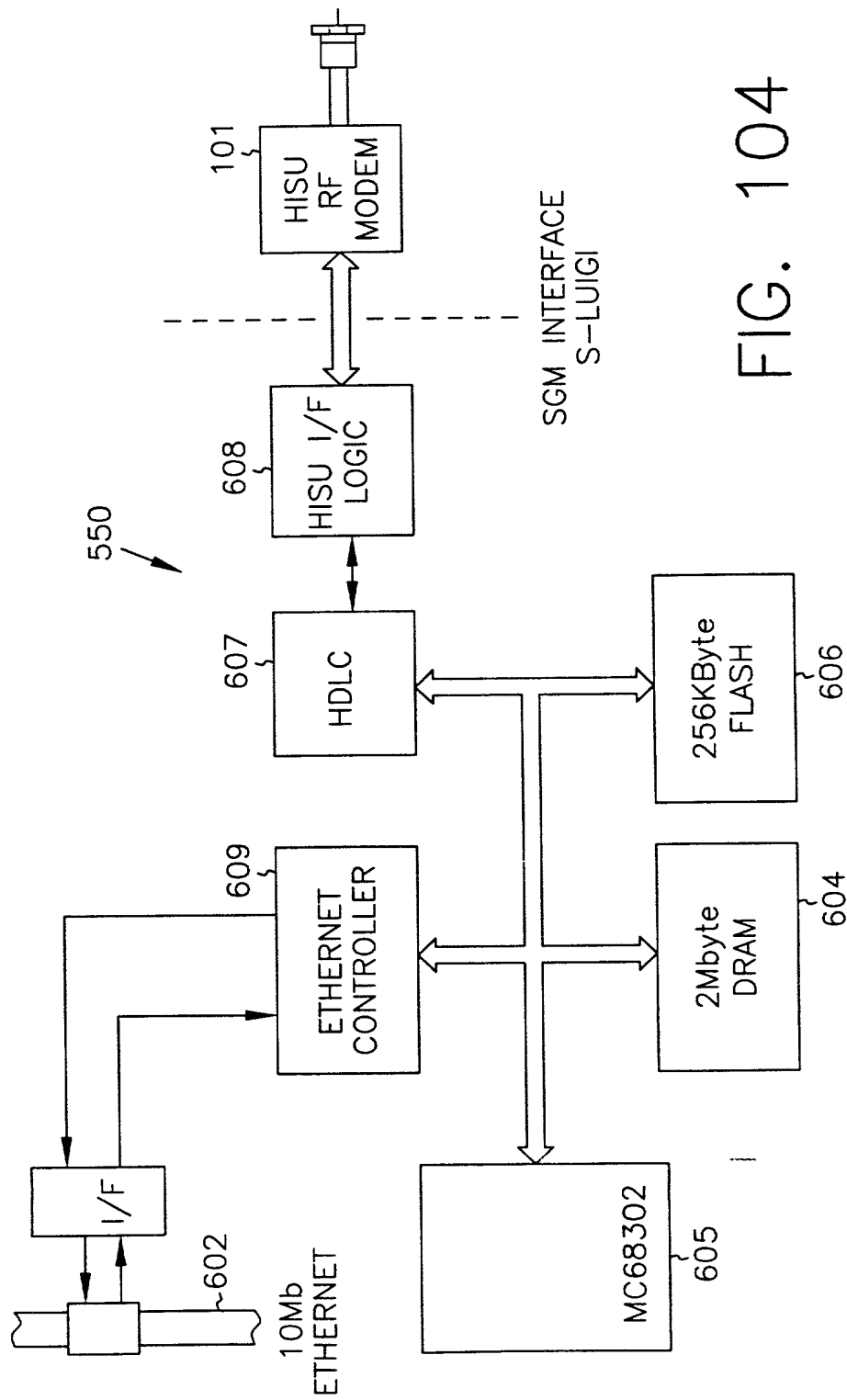


FIG. 104

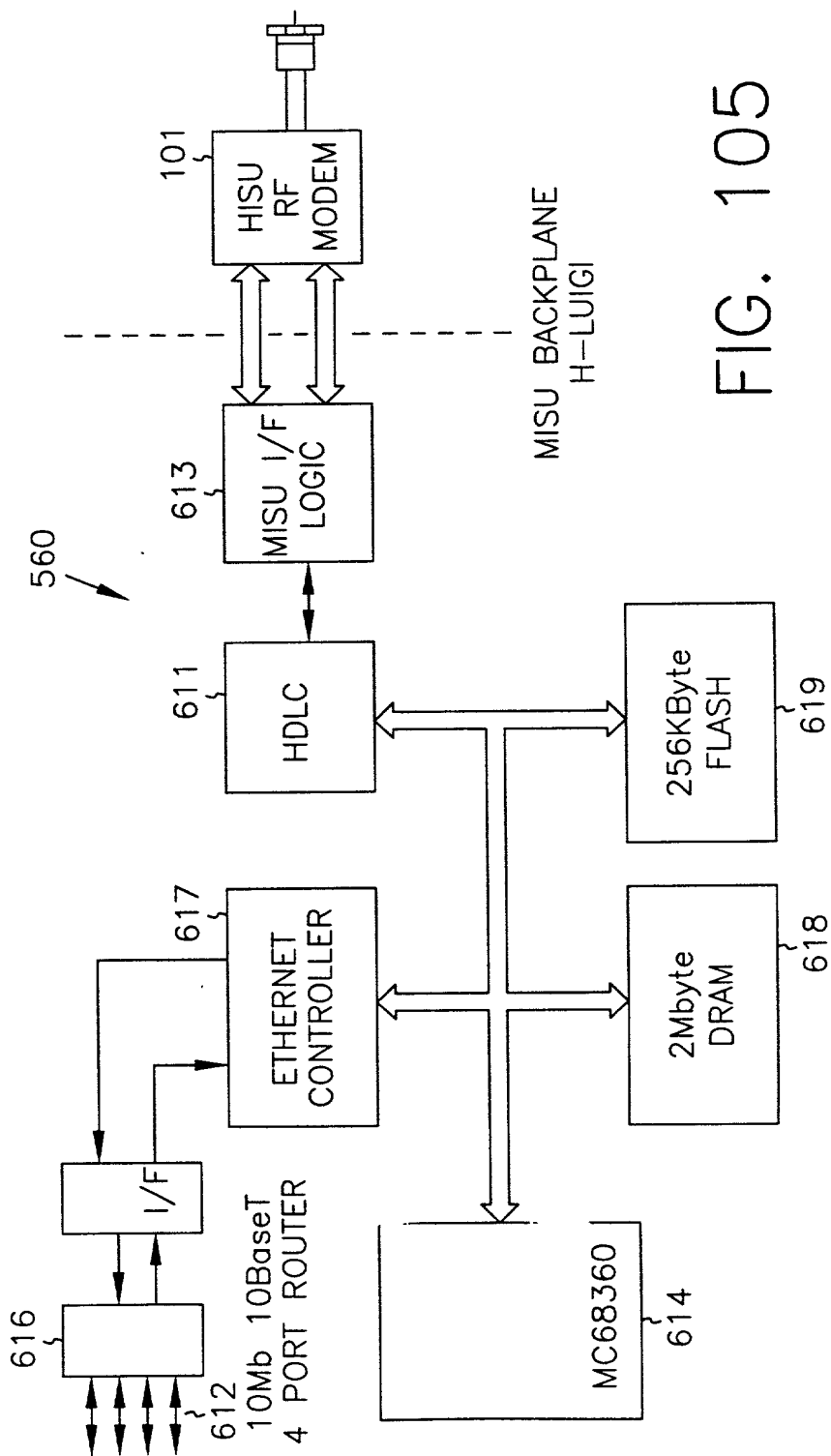


FIG. 105

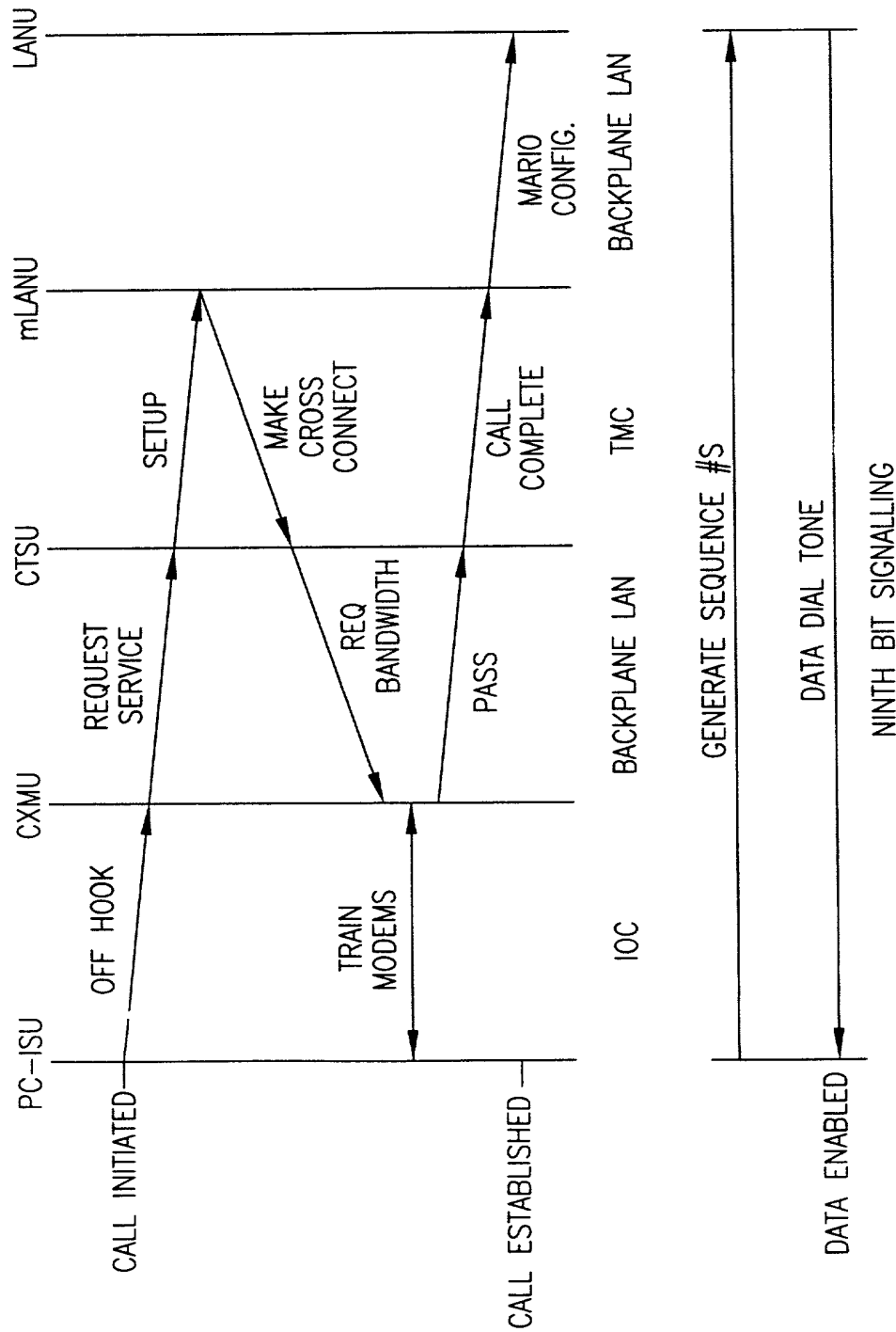


FIG. 106

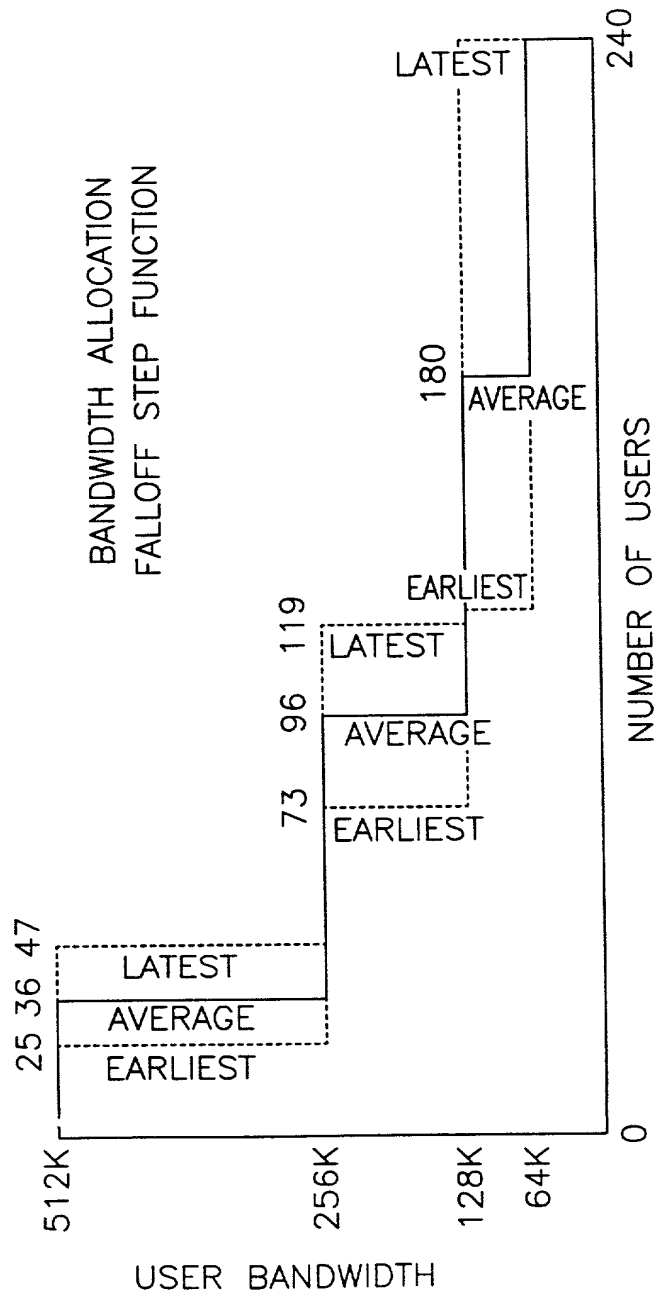


FIG. 107

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

THE RF SPECTRUM OF 24 USERS WITH 512Kbs

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

ADDING THE 25th USER

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

ADDING THE 26th USER, ETC

FIG. 108

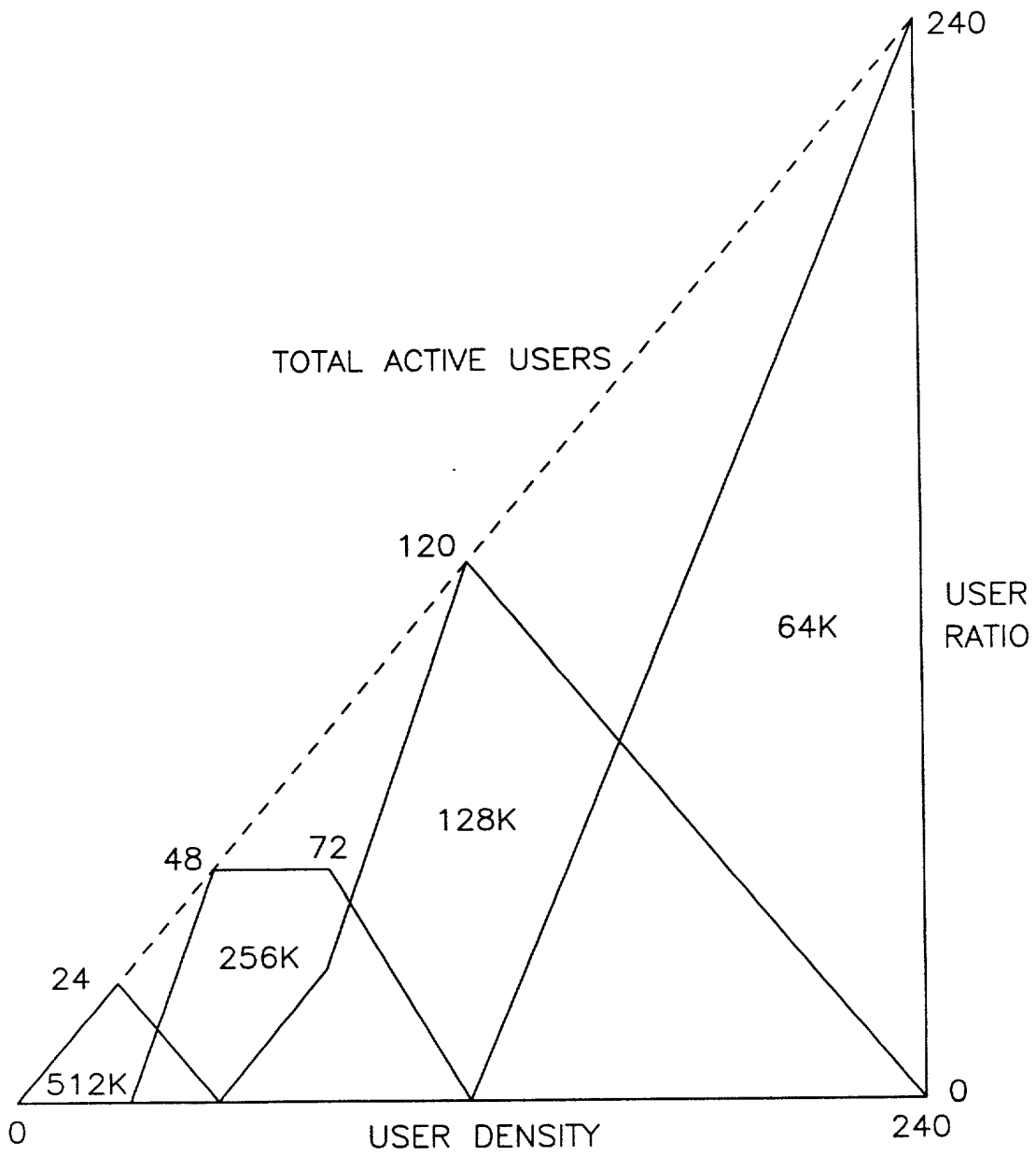


FIG. 109

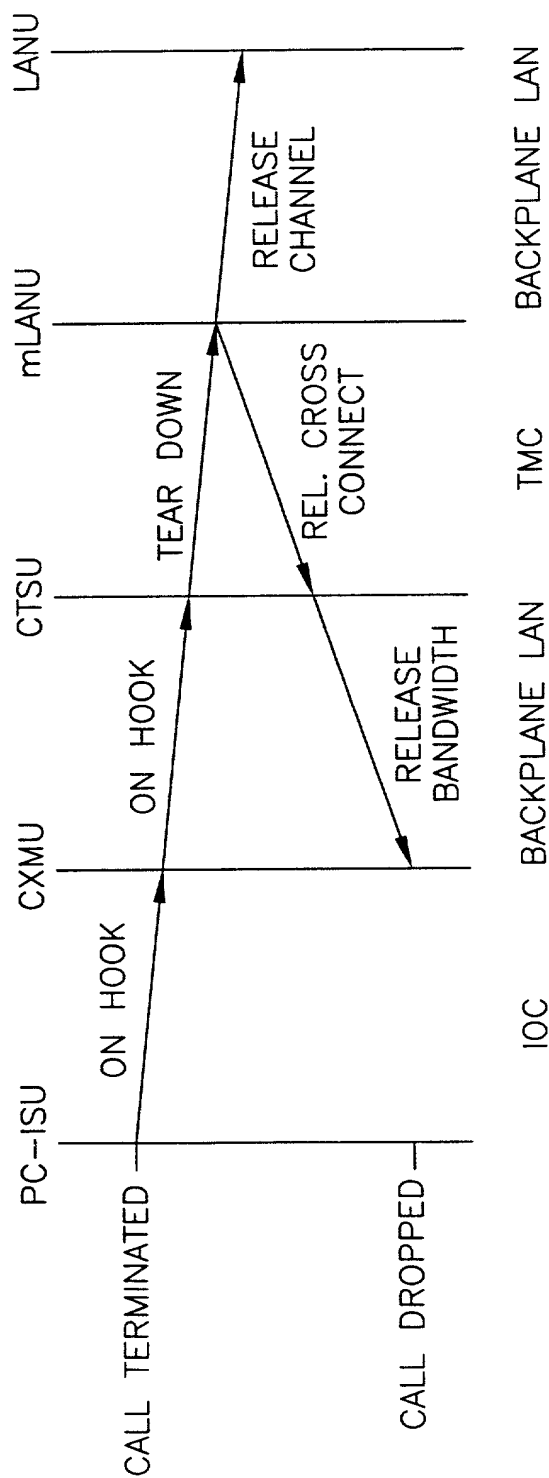


FIG. 110

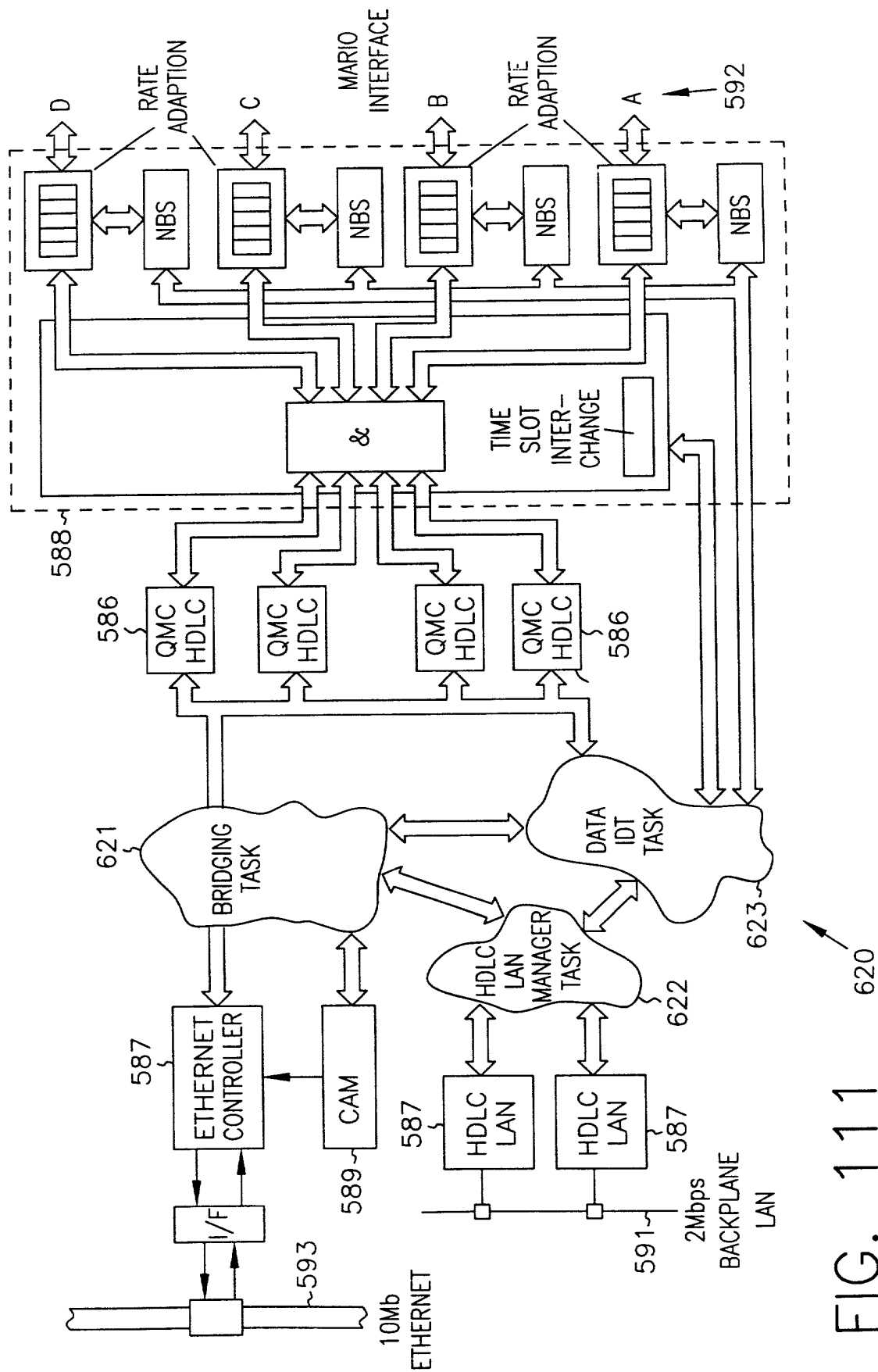


FIG. 111

620

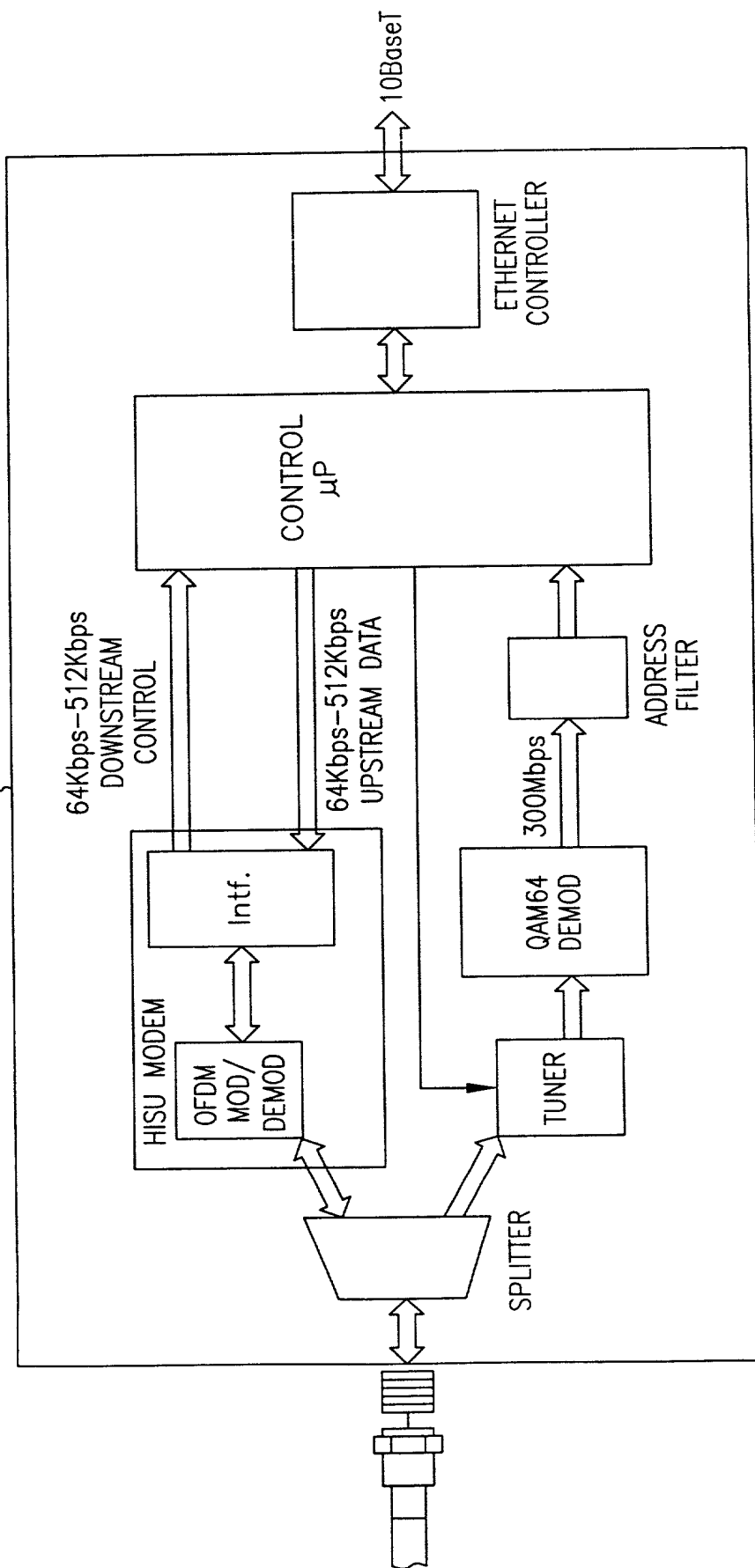


FIG. 112

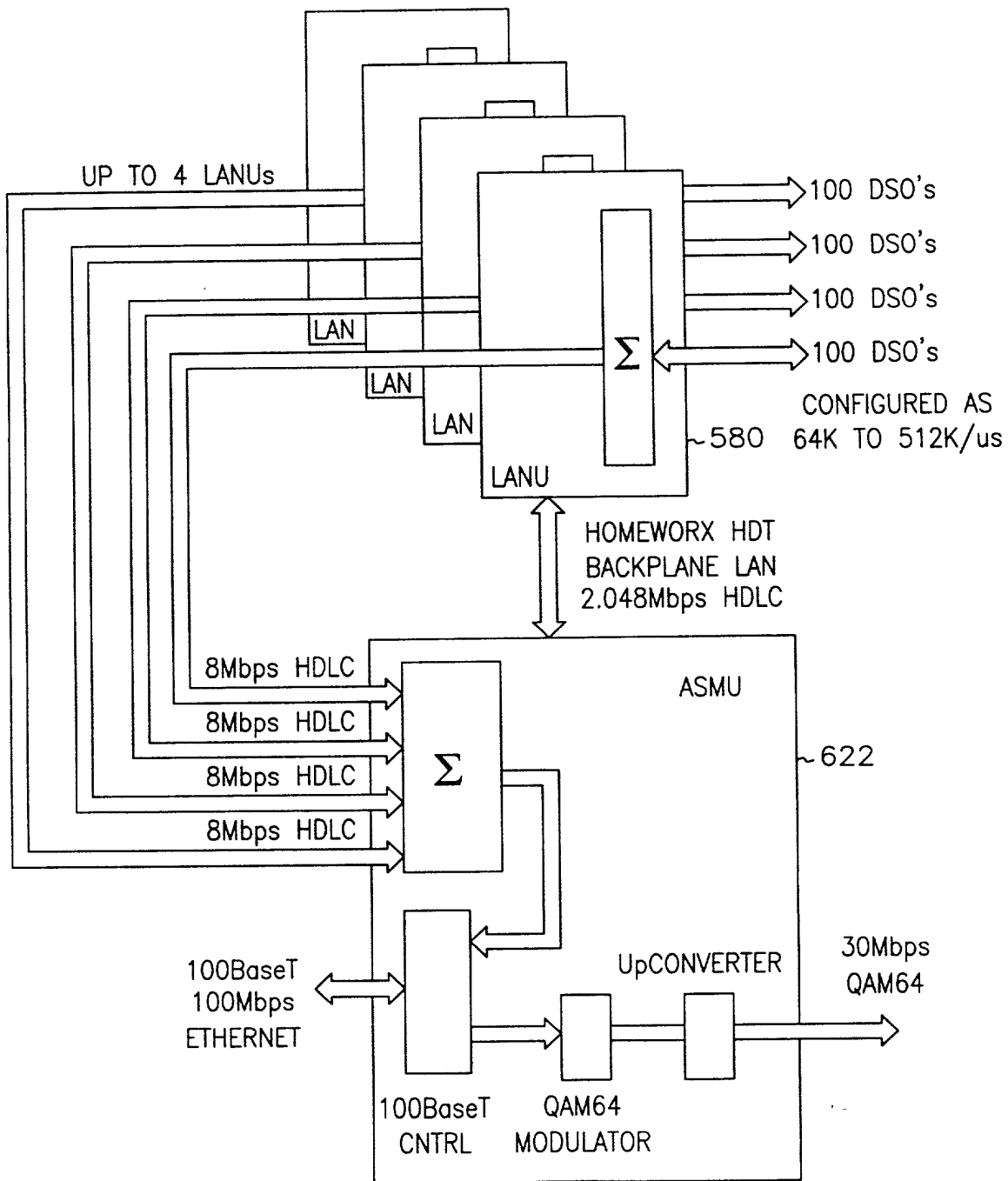


FIG. 113

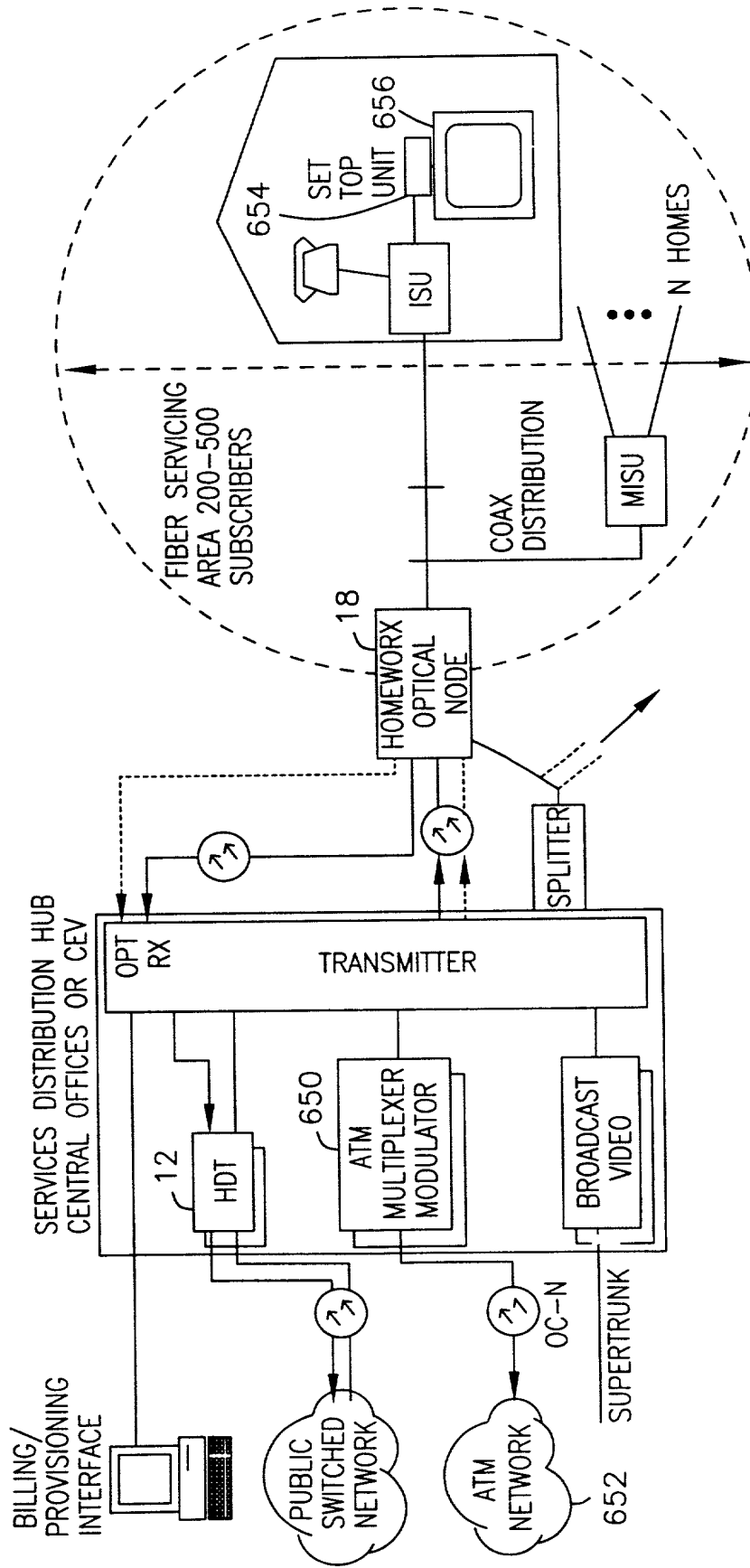


FIG. 114

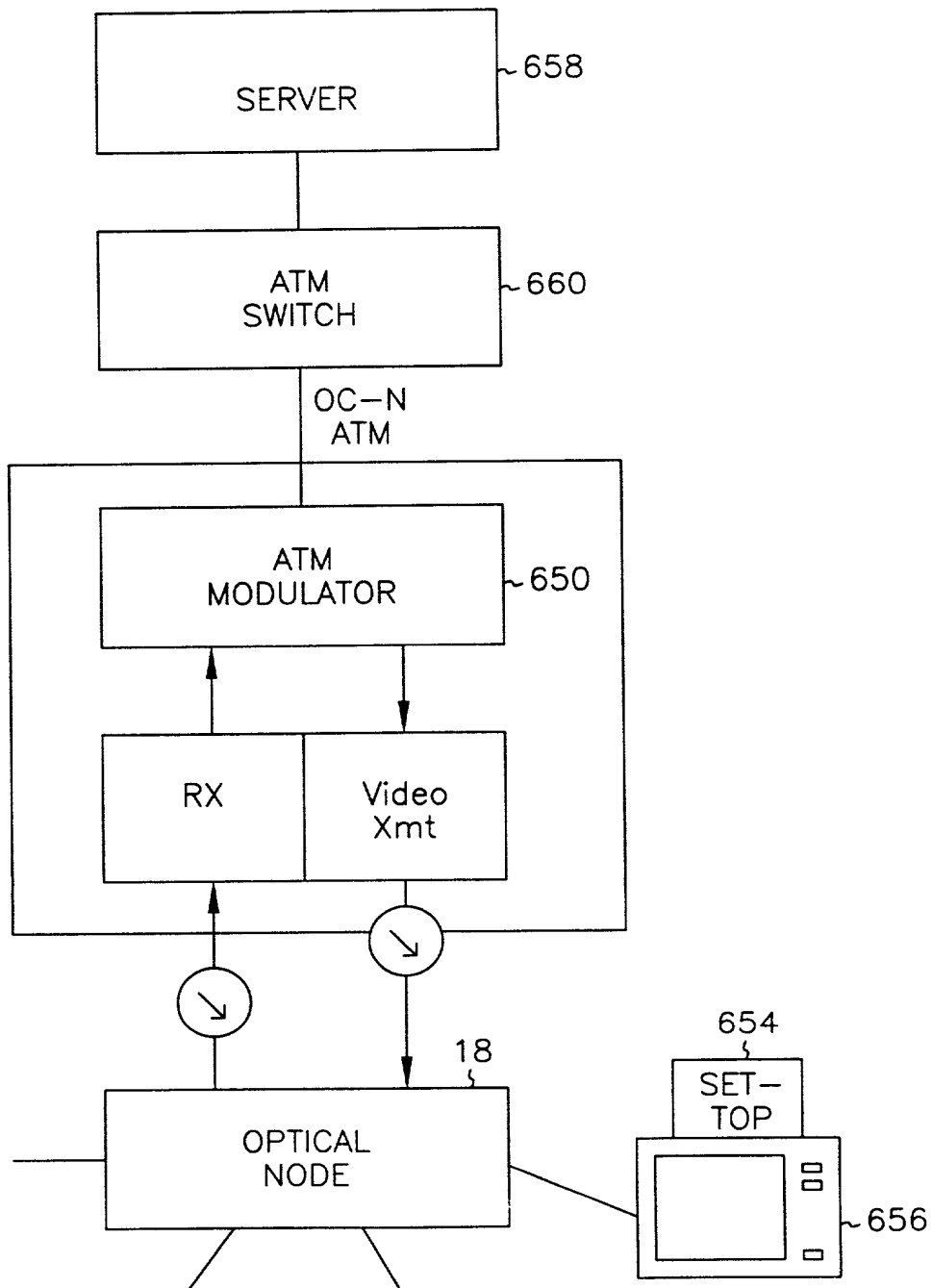


FIG. 115

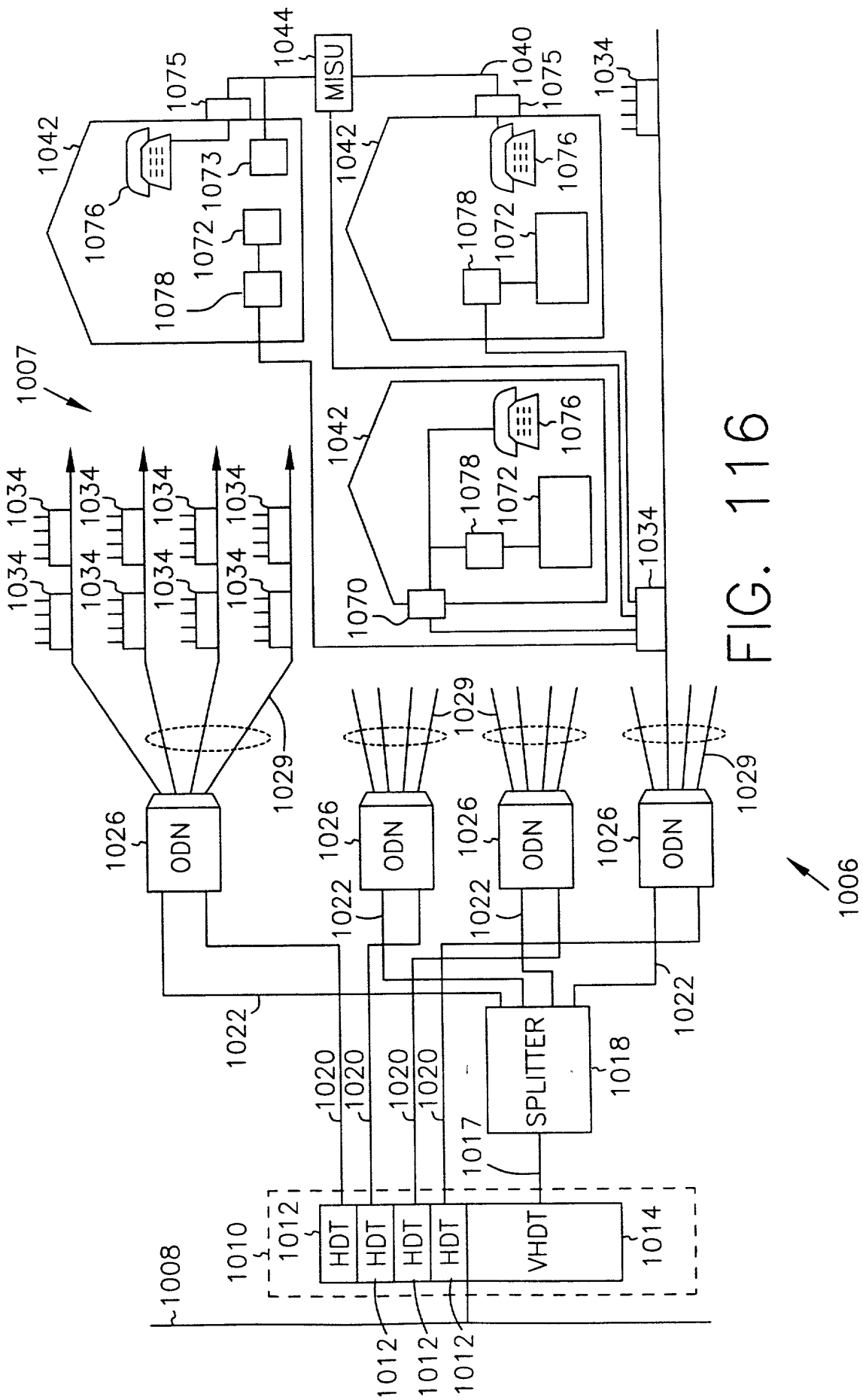


FIG. 116

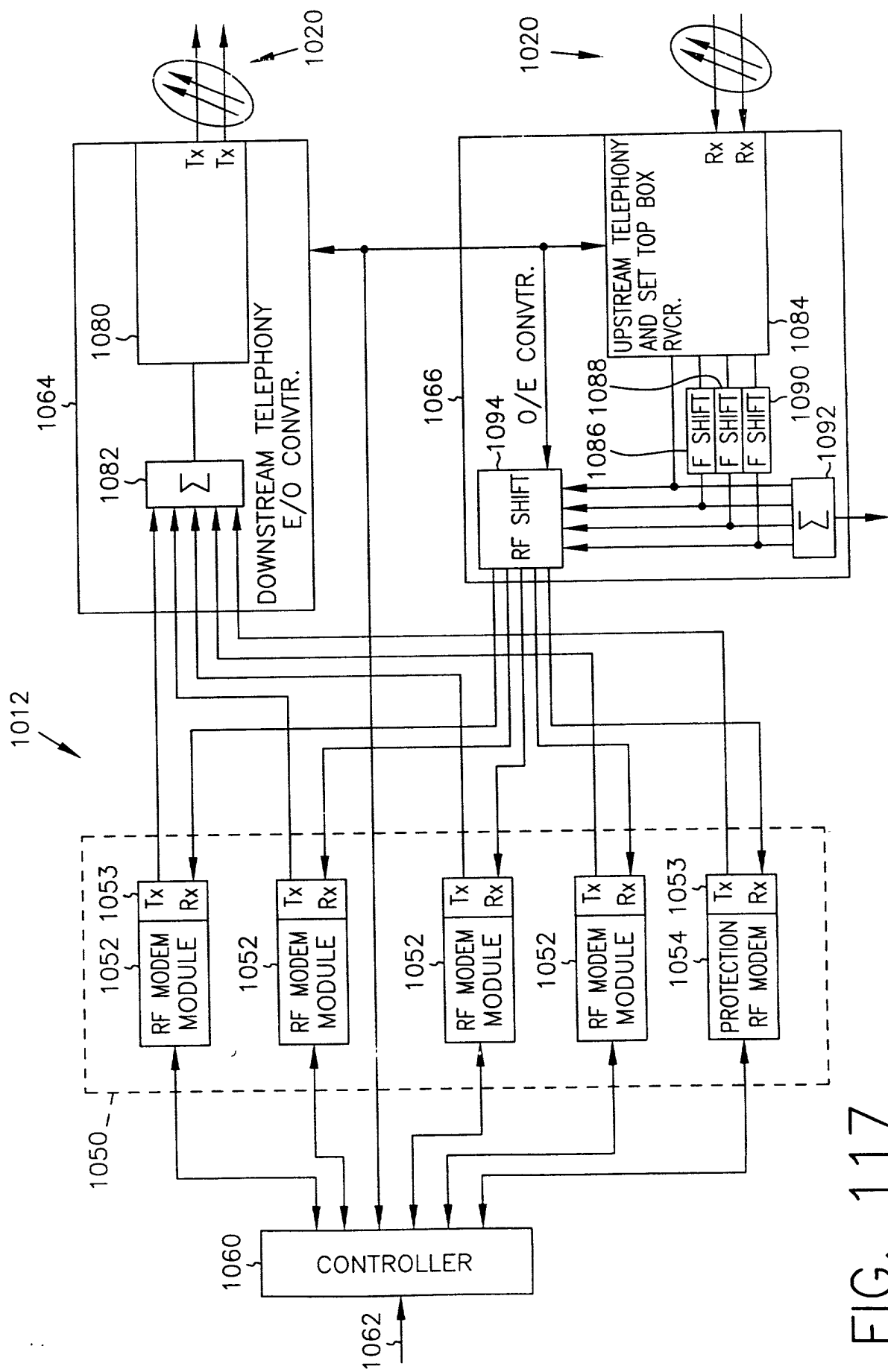


FIG. 117

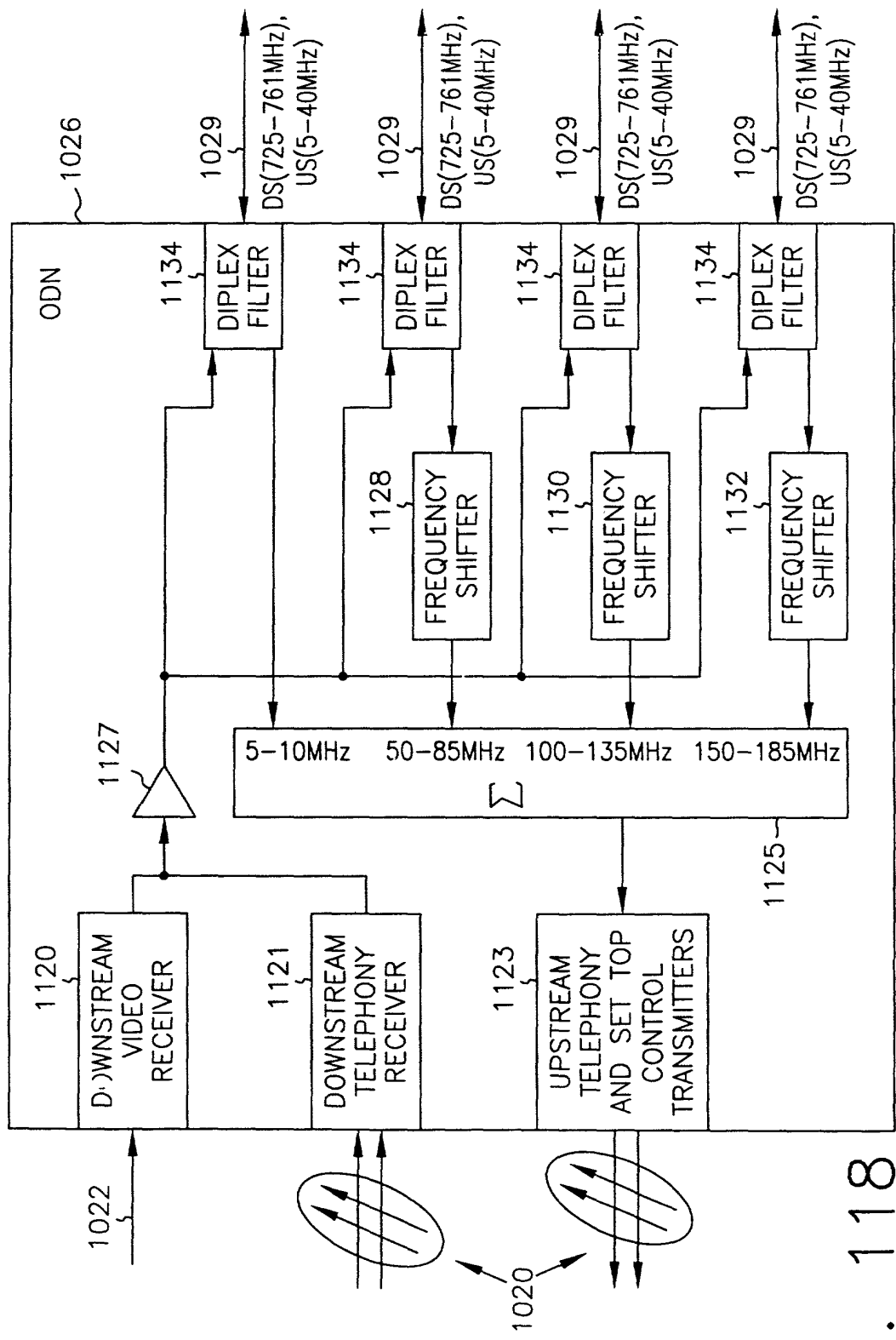


FIG. 118

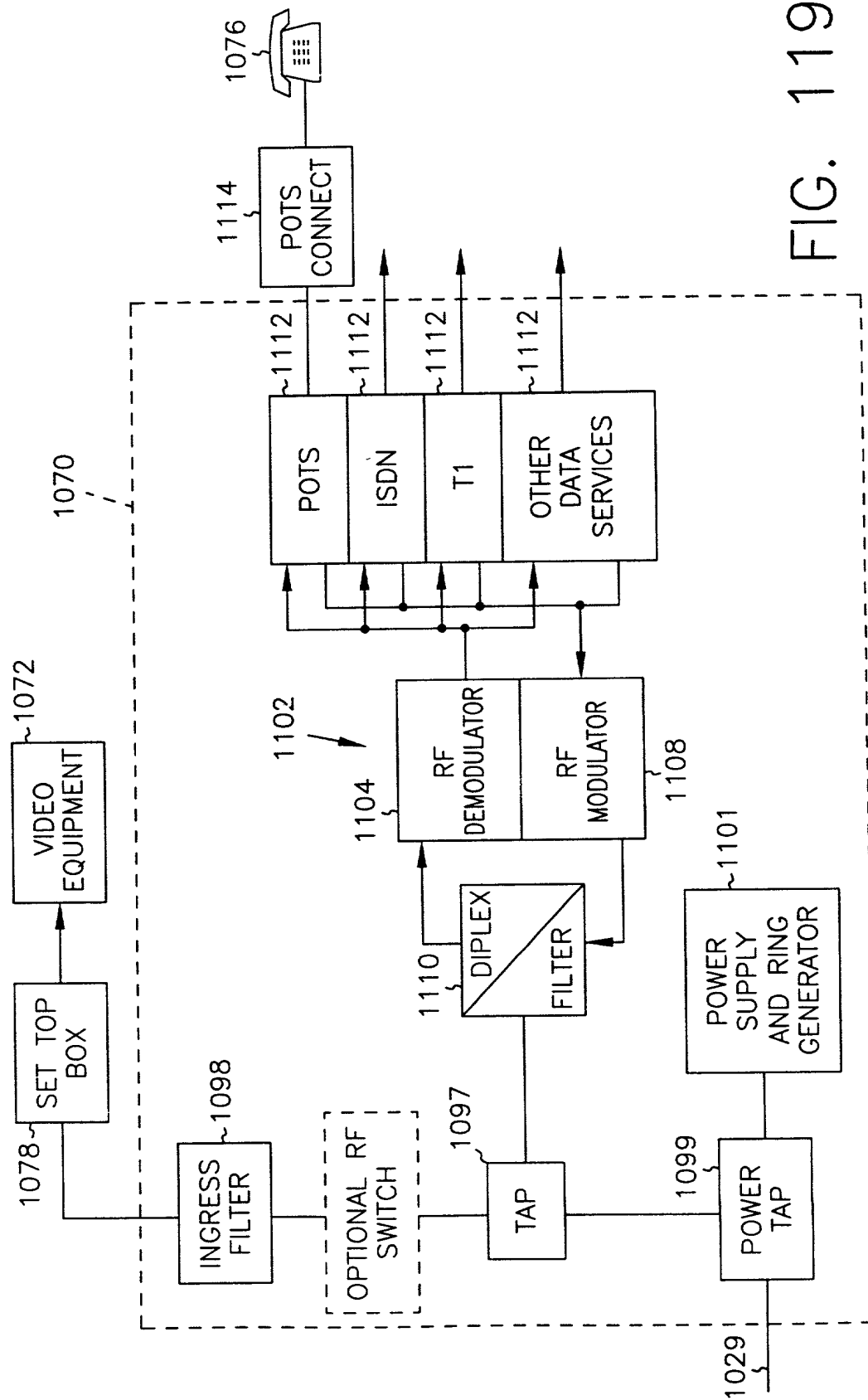


FIG. 119

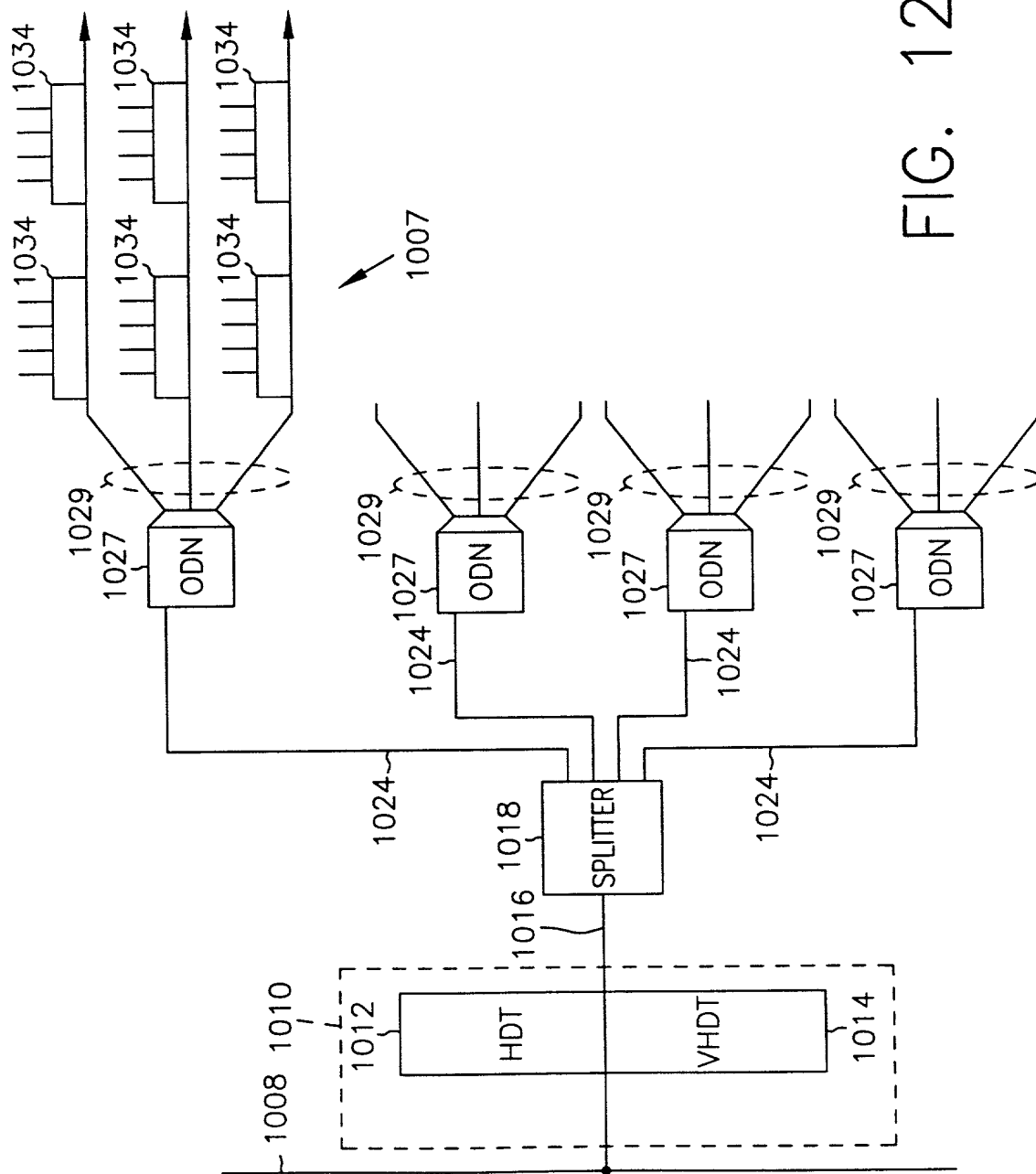


FIG. 120

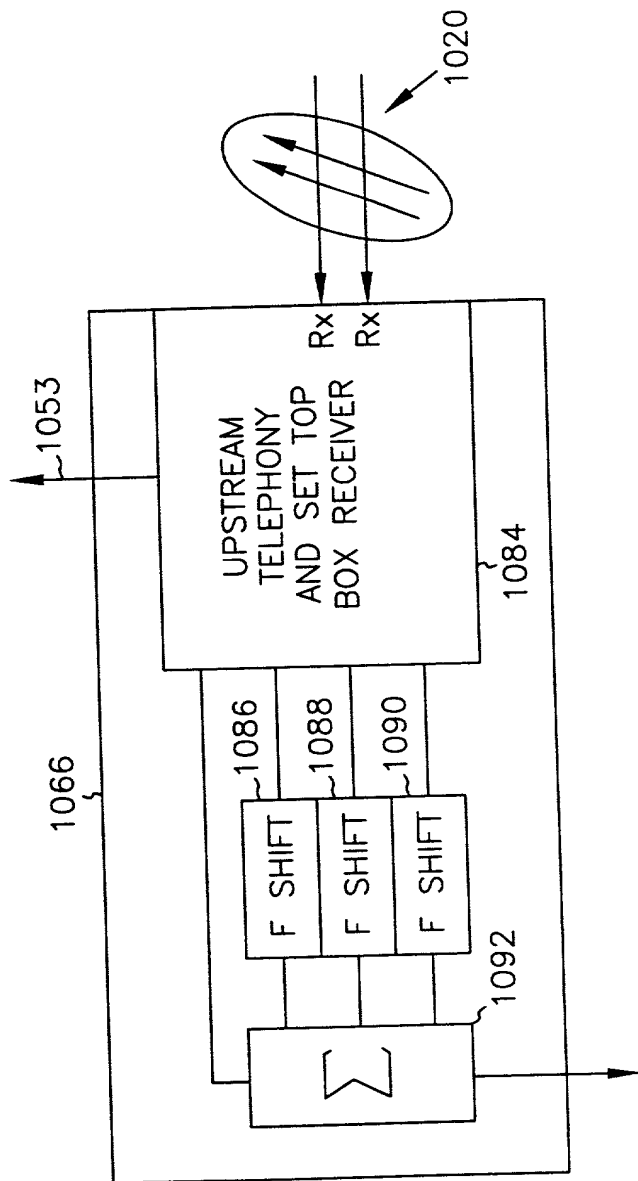


FIG. 122

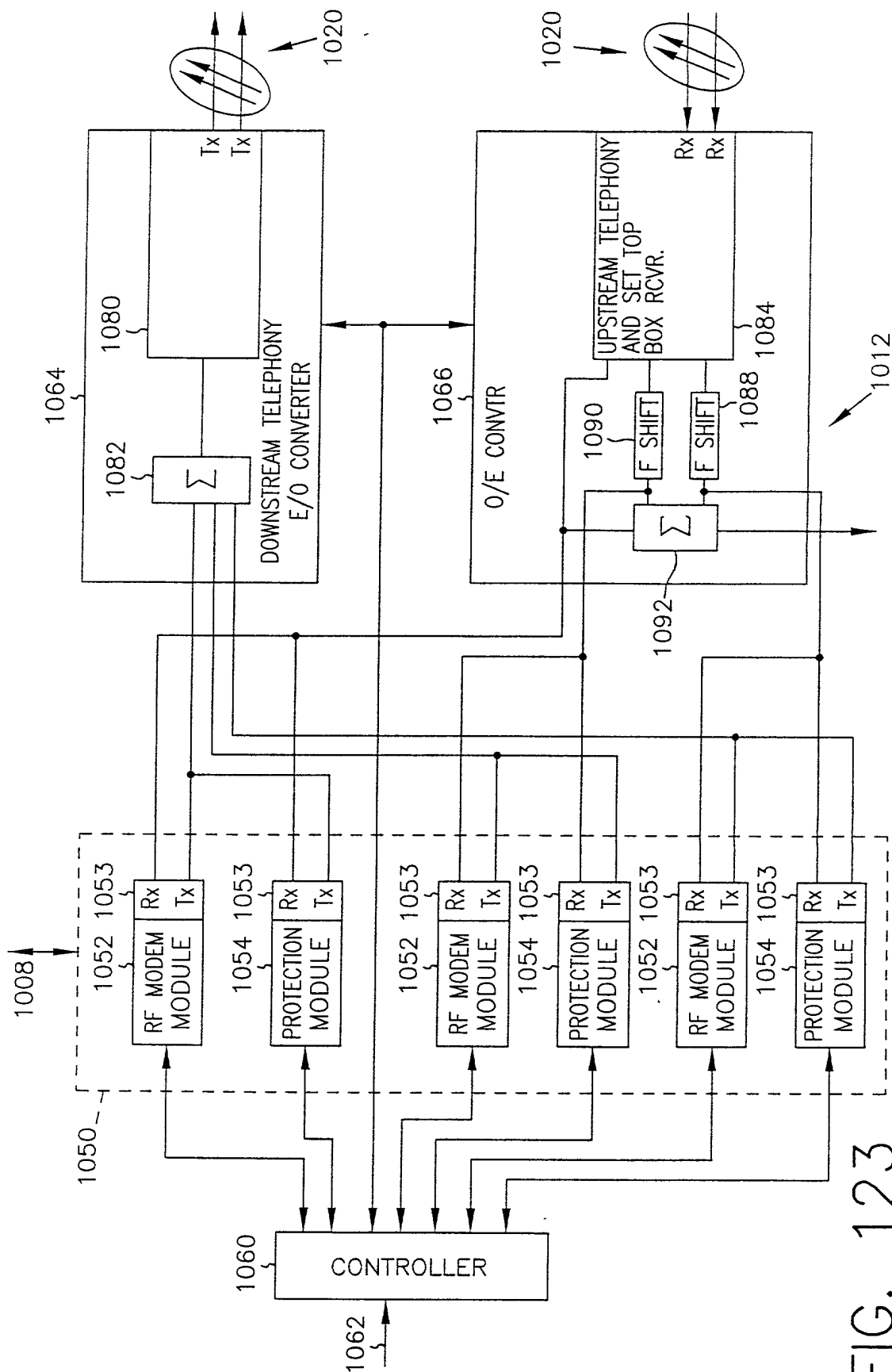


FIG. 123